KAPLAN MEDICAL

USMLE®* Step 2 CK

Psychiatry, Epidemiology, & Ethics

Lecture Notes

BL4021K

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10 9 8 7 6 5 4 3 2 1

Contents

Psychiatry

Epidemiology & Ethics

Psychiatry

Mental Status Examination 1

The mental status examination is used to describe the clinician's observations and impression of the patient during the interview. In conjunction with the history of the patient, it is the best way to make an accurate diagnosis.

General Description

- *Appearance:* grooming, poise, clothes, body type (disheveled, neat, childlike, etc.)
- *Behavior:* quantitative and qualitative aspects of the patient's motor behavior (restless, tics, etc.)
- *Attitude toward the examiner:* (cooperative, frank, and seductive)

Mood and Affect

- *Mood:* emotions perceived by the patient (depressed, anxious, angry, etc.)
- *Affect:* patient's present emotional responsiveness (blunted, flat, labile, etc.)
- *Appropriateness:* in reference to the context of the subject (appropriate or inappropriate)

Speech: The physical characteristics of speech (relevant, coherent, fluent, etc.)

Perceptual disturbances: Experienced in reference to self or the environment (hallucinations, illusions)

- *Hallucinations:* false sensory perceptions without a stimuli
  - Auditory: psychotic disorders
  - Visual: drugs, organic diseases
  - Tactile: cocaine intoxication, alcohol withdrawal
  - Olfactory: seizures
- *Illusions:* sensory misperceptions, have a stimuli

Thought

- *Form of thought:* the way in which a person thinks (flight of ideas, loose associations, tangentiality, circumstantiality, etc.)
- *Content of thought:* what the person is actually thinking about (delusions, paranoia, and suicidal ideas)

Sensorium and Cognition

- Alertness and level of consciousness (awake, clouding of consciousness, etc.)
- Orientation: time, place, and person
- Memory: recent, remote, recent past, and immediate retention and recall
- Concentration and attention: serial sevens, ability to spell backwards.
- Capacity to read and write: Ask patient to read a sentence and perform what it says.

- Visuospatial ability: copy a figure
- Abstract thinking: similarities and proverb interpretation
- Fund of information and knowledge: calculating ability, name past presidents

Impulse Control: Estimated from history or behavior during the interview

Judgment and Insight: Ability to act appropriately and self-reflect

Reliability: Physician's impressions of the patient's ability to accurately assess his situation

Interviewing Techniques

Open-Ended Questions: Allow the patient to speak in his own words as much as possible.

"Can you describe your pain?"

Closed-Ended Questions: Ask for specific information without allowing options in answering.

"Are you hearing voices?"

Facilitation: Physician helps the patient continue by providing verbal and nonverbal cues.

"Yes, continue."

Confrontation: Physician points something out to the patient.

"You are very upset today."

Leading: The answer in the question.

"Are the voices telling you to hurt yourself?"

Review Questions

1. A 20-year-old man presents to your office complaining of auditory hallucinations for approximately 7 months in duration. He reports hearing his father's voice and at times his mother's voice as well. The patient appears distressed by the hallucinations and wants your help. Which of the following would be the most appropriate statement at this time?

   (A) "What do the voices say?"
   (B) "Have you taken medication?"
   (C) "Why do you think you hear voices?"
   (D) "How is the relationship with your parents?"
   (E) "Tell me about the voices."

2. A 30-year-old woman comes to see you after her mother's death approximately 3 weeks ago. Since then she has complained of depressed mood and feelings of helplessness. While in your office, she begins to cry. Which of the following would be the next step in the management of this patient?

   (A) "I will come back when you stop crying."
   (B) "Do you feel guilty about your mother's death?"
   (C) Offer tissue and remain silent
   (D) "Go ahead; it is normal to cry."
   (E) Refer to psychiatrist for further evaluation

1. **Answer: E.** The ideal interviewing technique is to begin with an open-ended question and conclude with closed-ended questions. Choices A, C, D, and E are all open-ended questions. However, the best open-ended question for this patient and the reason he came to see you is choice E.

2. **Answer: C.** One should always express empathy and then give the patient control. By offering a tissue, you are doing just that. Choice E is always incorrect.

Defense Mechanisms 2

Id: Drives (instincts) present at birth. There are only two drives: sex and aggression.

Ego: Defense mechanisms, judgment, relation to reality, object relationships, developed shortly after birth

Superego: Conscience, formed during latency period, right vs. wrong

DEFENSE MECHANISMS

Defense mechanisms are the way and means that the **ego** wards off anxiety and controls instinctive urges and unpleasant affects (emotions). They are unconscious (except suppression), discrete, dynamic and irreversible, and adaptive and maladaptive.

Types of Defense Mechanisms

Projection: Attributing your own wishes, thoughts, or feelings onto someone else.

"I'm sure my wife is cheating on me."

Denial: Used to avoid becoming aware of some painful aspect of reality.

"I know I do not have cancer."

Splitting: External objects are divided into all good or all bad.

"The morning staff is much better than the evening staff."

Blocking: Temporary block in thinking.

"I can't seem to remember his name."

Regression: Return to an earlier stage of development, most immature.

"Ever since my divorce, my 5-year-old has begun to wet the bed."

Somatization: Psychic derivatives are converted into bodily symptoms.

"Just thinking of the exam I get butterflies in my stomach."

Introjection: Features of the external world are taken and made part of the self.

The resident physician dresses like the attending.

Displacement: An emotion or drive is shifted to another that resembles the original in some aspect.

"I had to get rid of the dog since my husband kicked it every time we had an argument."

Repression: An idea or feeling is withheld from consciousness; unconscious forgetting.

"I do not remember having had a dog."

Intellectualization: Excessive use of intellectual processes to avoid affective expression or experience.

"It is interesting to note the specific skin lesions which seem to arise as a consequence of my end-stage disease."

Isolation: Separation of an idea from the affect that accompanies it.

"As she arrived at the station to identify the body, she appeared to show no emotion."

Rationalization: Rational explanations are used to justify unacceptable attitudes, beliefs, or behaviors.

"I did not pass the test because it was very difficult."

Reaction formation: An unacceptable impulse is transformed into its opposite; results in the formation of character traits.

"Listen to him tell his family he was not afraid, when I saw him crying."

Undoing: Acting out the reverse of an unacceptable behavior; consists of an act.

"I need to wash my hands whenever I have these thoughts."

Acting out: Behavioral or emotional outburst.

"I can't explain why he has those temper tantrums."

Humor: Permits the expression of feelings and thoughts without personal discomfort.

"So," said the 300-pound man, "they expected me to place my head between my legs in the event of a plane crash when the best I could manage was placing my chin on my chest."

Sublimation: Impulse gratification has been achieved, but the aim or object has been changed from unacceptable to acceptable; allows instincts to be channeled. Most mature of the defenses.

Jack the Ripper becomes a surgeon.

Suppression: Conscious forgetting; only conscious defense mechanism.

"I would rather forget that my dog was run over by a car."

Dissociation: Splitting off of the brain from conscious awareness.

"I do not know where I live."

Review Question

A nurse, working in a hospice, has been ignoring an elderly female patient who has terminal cancer. When asked why she has been ignoring the patient, the nurse replied, "She wants to be left alone." Which of the following defense mechanisms best explains her response?

(A) Rationalization
(B) Isolation of affect
(C) Intellectualization
(D) Projection
(E) Denial

Answer: D. The nurse is projecting her wishes by stating that the patient wants to be left alone, when in reality it is *she* who wants to be left alone. Rationalization (A) is making excuses for your behavior. Had that been the answer, she would have made excuses, such as she's too busy, etc.

TESTS

Intelligence Tests

Intelligence Quotient (IQ) measures academic performance.

$$IQ = MA/CA \times 100; \text{ Mean IQ} = 100 \text{ (SD} = 15)$$

Adults: Wechsler Adult Intelligence Scale Revised (WAIS-R)

Children: Wechsler Intelligence Scale for Children Revised (WISC-R), Stanford-Binet

Personality Tests

Objective tests use simple stimuli, do not need much clinical experience: Minnesota Multiphasic Personality Inventory (MMPI).

Projective tests use ambiguous stimuli, need clinical experience, not diagnostic: Rorschach test (inkblot), Thematic Apperception Test (TAT), sentence completion, drawings.

Childhood Disorders 3

MENTAL RETARDATION

Definition. Also called intellectual developmental disorder. There must be significantly subaverage intellectual function (IQ <70), as measured by a variety of IQ tests. This must be accompanied by concurrent impairment in adapting to demands in school, work, social, and other environments. Onset is age <18.

Risk Factors/Etiology. Associated genetic and chromosomal abnormalities include inborn errors of metabolism (e.g., lipidoses, aminoacidurias, glycogen storage diseases) and chromosomal abnormalities (e.g., cri du chat syndrome, Down syndrome, fragile X syndrome). Associated intrauterine infections include rubella, cytomegalovirus, and other viruses. Intrauterine exposure to toxins and other insults such as alcohol, hypoxia, or malnutrition may be causal. Postnatal causes include exposure to toxins and infection, poor prenatal care, postnatal exposure to heavy metals, physical trauma, and social deprivation.

Presenting Symptoms

- *Prevalence:* 1% of the population. Occurs at a 1.5:1 male-to-female ratio.
- *Mild retardation (IQ 50–69):* Attain academic skills to approximately the sixth-grade level, often live independently in the community or with minimal supervision, may have problems with impulse control and self-esteem, and may have associated conduct disorders, substance-related disorders, and attention deficit hyperactivity disorder (ADHD).
- *Moderate retardation (IQ 35–50):* Attain academic skills to a second-grade level, may be able to manage activities of daily living, work in sheltered workshops, live in residential community settings, and have significant problems conforming to social norms. Individuals with Down's syndrome are at high risk for early development of Alzheimer's disease.
- *Severe (IQ 20–35) and profound retardation (IQ <20)*: Little or no speech, very limited abilities to manage self-care, requires highly supervised care settings.

Physical Examination. Evidence of underlying disorder or injury

Diagnostic Tests. Amniocentesis: May reveal chromosomal abnormalities associated with mental retardation in high-risk pregnancies (mother age >35.)

Treatment. Primary prevention includes genetic counseling, good prenatal care, and safe environments. Treatment of associated general medical conditions may improve overall level of cognitive and adaptive function. Special education techniques may improve ultimate level of function. Behavioral guidance and attention to promoting self-esteem may improve long-term emotional adjustment.

Differential Diagnosis. Includes learning and communication disorders, sensory impairment, autistic disorder, borderline intellectual functioning (IQ 70–100), and environmental deprivation.

LEARNING DISORDERS

Definition. Characterized by learning achievement in specific areas that is substantially below expectations, given the patient's age, intelligence, sensory abilities, and educational experience. Types are reading disorder (most common), mathematics disorder, and disorder of written expression.

Risk Factors/Etiology. Some cases are due to the effects of coexisting general medical conditions such as cerebral palsy on the central nervous system (CNS) function. Some general medical conditions and substance-induced conditions are associated with learning disorders, including lead poisoning and fetal alcohol syndrome. Many cases have no obvious etiology.

Presenting Symptoms

- Prevalence: 5% of school-age children
- Onset: usually during elementary school
- Perceptual–motor problems may be present.
- Conduct disorder, oppositional defiant disorder, and ADHD may be present.
- Poor self-esteem and social immaturity may be present.
- School failure and behavioral disturbances may occur.

Deficits sometimes persist into adulthood and interfere with occupational function.

Diagnostic Tests. IQ testing and academic achievement tests are the major diagnostic tools.

Treatment. Special education to ensure general learning and maximize skills in the deficient areas is the mainstay of treatment. Counseling of patients and families to improve self-esteem, social behavior, and family functioning is helpful.

Differential Diagnosis. Major rule-outs are environmental deprivation, hearing or vision impairment, and mental retardation.

AUTISM SPECTRUM DISORDER

Definition: A group of disorders characterized by problems with social interaction, behavior, and language.

Previous types included:

- Autism
- Rett's: girls > boys, microcephaly, loss of purposeful hand movements resulting in stereotypic movements such as hand-wringing, loss of language and ataxia
- Asperger's: both language and IQ are normal

Risk Factors/Etiology. The cause is CNS damage due to known or unknown factors. Sites of CNS damage specifically associated with autistic disorder are unknown. General medical conditions associated with autistic disorder include encephalitis, maternal rubella, PKU, tuberous sclerosis, fragile X syndrome, and perinatal anoxia. There is no obvious etiology in many cases.

Presenting Symptoms

- *Prevalence:* 0.08% of the general population. Occurs at a 5:1 male-to-female ratio.
- *Onset:* Before 3 years of age
- *Social symptoms:* Lack of peer relationships and a failure to use nonverbal social cues
- *Communication symptoms:* Absent or bizarre use of speech
- *Behavioral symptoms:* Odd preoccupation with repetitive activities, bizarre mannerisms, and rigid adherence to purposeless ritual
- Mental retardation is present in 75% of patients with autistic disorder.
- *Physical findings:* Higher incidence of abnormal electroencephalograms (EEGs), seizures, and abnormal brain morphology
- *Course:* Approximately 30% of individuals with autistic disorder become semi-independent in adulthood, but almost all have severe residual disabilities.
- Predictors of a poor outcome are associated mental retardation and failure to develop useful speech.
- Seizures develop by adulthood in 25% of autistic individuals.

Physical Examination. Self-injuries caused by head banging or biting sometimes present.

Treatment. The major treatment is family counseling, special education, and newer antipsychotic medications to control episodes of severe agitation or self-destructive behavior.

Differential Diagnosis. Major rule-outs are mental retardation, hearing impairment, environmental deprivation, selective mutism, Rett syndrome, and Asperger syndrome.

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

Definition. ADHD is characterized by inattention, hyperactivity, and impulsivity that interfere with social or academic function. Symptoms last for at least 6 months, and onset occurs before age 7. Symptoms are present in multiple settings. Subtypes are based on the predominance of symptoms of inattention or of hyperactivity and impulsivity.

Risk Factors/Etiology. No specific etiologies have been identified. Other CNS pathology and disadvantaged family and school situations are sometimes present.

Prevalence. 5% of school-age children. Male-to-female ratio is 9:1.

Family history. ADHD, mood and anxiety disorders, substance-related disorders, and antisocial personality disorder.

Onset. Usually first recognized when a child enters school, and symptoms usually persist throughout childhood. ADHD persists into adulthood in approximately 30% of affected individuals.

Symptoms. Short attention span, constant fidgeting, inability to sit through cartoons or meals, inability to wait in lines, failure to stay quiet or sit still in class, disobedience, shunning by peers, fighting, poor academic performance, carelessness, and poor relationships with siblings.

Common Associated Problems. Low self-esteem, mood lability, conduct disorder, learning disorders, motor skills disorder, communication disorders, drug abuse, school failure, and physical trauma as a result of impulsivity.

Physical Examination. Perceptual: motor problems and uncoordination can be present.

Diagnostic Tests. IQ tests and various structured symptom-rating scales for use by teachers and parents are often used.

Differential Diagnosis. Major rule-outs are age-appropriate behavior, response to environmental problems, mental retardation, autistic disorder, and mood disorders.

Treatment. Target symptoms are defined before initiating treatment. Psychological, social, and educational interventions include adding structure and stability to home and school environments. Specialized educational techniques include the use of multiple sensory modalities for teaching, instructions that are short and frequently repeated, immediate reinforcement for learning, and minimization of classroom distractions. Pharmacotherapy of choice is stimulant medications, such as methylphenidate and dextroamphetamine. Non-stimulants such as atomoxetine may also be used. They are usually effective in decreasing hyperactivity, inattention, and impulsivity. Other medications include various antidepressants and clonidine.

CONDUCT DISORDER

Definition. Persistent violations in 4 areas: aggression, property destruction, deceitfulness or theft, and rules.

Risk Factors/Etiology. Genetic influences play a role by affecting temperament. Stressful family and school environments have also been implicated.

Prevalence. 10% of school-age children. Occurs at a 9:1 male-to-female ratio.

Family History. Antisocial personality disorder, conduct disorder, ADHD, mood disorders, and substance-related disorders.

Onset. Most often during late childhood or early adolescence.

Course. In most individuals, the symptoms gradually remit.

Key Symptoms. Bullying, fighting, cruelty to people or animals, and rape, vandalism, fire-setting, theft, robbery, running away, and/or school truancy.

Complications. Substance-related disorders and school failures.

Outcome. Often, antisocial personality disorder, somatoform disorders, depressive disorders, and substance-related disorders.

Differential Diagnosis. Major rule-outs are environmental problems, ADHD, and oppositional defiant disorder.

Treatment. Healthy group identity and role models are provided by structured sports programs and other programs (e.g., Big Brothers). Structured living settings that place value on group identification and cooperation are useful. Punishment and incarceration are not often effective.

OPPOSITIONAL DEFIANT DISORDER

Definition. Persistent pattern of negativistic, hostile, and defiant behaviors toward adults, including arguments, temper outbursts, vindictiveness, and deliberate annoyance.

Risk Factors/Etiology. High reactivity and increased motor behavior are innate features of temperament that may predispose to this disorder. Inconsistent or poor parenting may also contribute.

Prevalence. 2–16% of school-age children. Male-to-female ratio is 1:1 after puberty but boys > girls before puberty.

Onset. Usually in latency or early adolescence and may start gradually. Onset later in girls.

Associated Problems. Family conflict and school failure, low self-esteem and mood lability, early onset of substance abuse, ADHD and learning disorders.

Course. Family conflict often escalates after the onset of symptoms.

Outcome. Conduct disorder often follows.

Treatment. Parents should be advised to spend time interacting with a child, to reward desired behavior and not simply punish undesired behavior, and to be consistent in statements and deeds. Alternative caregivers may be indicated in some cases.

Differential Diagnosis. Conduct disorder

CHILDHOOD ENURESIS

Definition. The disorder is characterized by repeated voiding of urine into the patient's clothes or bed in a child at least 5 years of age. It is diagnosed only if the behavior is not due to a medical condition.

Risk Factors/Etiology. Current psychologic stress, family history of enuresis, and urinary tract infections.

Prevalence. 3% of children aged 10. Slightly more common in boys. May occur only at night, only during daytime, or both. Often causes emotional turmoil in the child or parents.

Physical Examination. Assessment for urinary tract infection or abnormalities should occur.

Treatment. Appropriate toilet training and avoiding large amounts of fluids before bed are important, as are decreasing emotional stressors and rewarding the child with praise for a dry bed or clothes. A bell-pad apparatus is the best treatment. Pharmacotherapy includes imipramine and desmopressin (DDAVP) for short-term treatment.

CHILDHOOD ANXIETY

Definition. Normal childhood anxiety:

- *Stranger anxiety:* Fear of strangers in unfamiliar contexts that is present from age 6 months to approximately 2 years.
- *Separation anxiety:* Fear of separation from the caregiver that is present from approximately 1 to 3 years of age.

Risk Factors/Etiology. Excessively close-knit families, excessive expectations of children, and innate temperamental anxiety all predispose.

Prevalence. 5% of school-age children

Key Symptoms. Prominent physical complaints such as stomachaches and malaise, unrealistic fears (e.g., monsters) and nightmares, various phobias such as school phobia and fear of animals or the dark, difficulty sleeping, and self-mutilation such as scratching, nail-biting, and hair-pulling.

Physical Examination. Evidence of nail biting and scratching is sometimes present.

Treatment. Family therapy helps parents recognize and lessen childhood anxiety. Cognitive behavioral therapy is useful to decrease anxiety in older children.

Complications. Social avoidance, low self-esteem, and inhibited social development may occur.

TOURETTE DISORDER

Definition. Childhood onset of multiple motor and vocal tics

Risk Factors/Etiology. Autosomal dominant transmission may occur in some cases. There are associations between ADHD (50%) and obsessive compulsive disorder (OCD) (40%). Abnormalities in the dopaminergic and adrenergic system have been implicated.

Prevalence. 5 per 10,000. Twice as frequent in males.

Onset. Average age 7 years with motor tics and vocal tics typically appearing at age 11 years

Course. Vocal and motor tics wax and wane over time.

- *Motor tics:* May present as twitching of face, trunk, or extremities or may involve complex behaviors such as pacing, spinning, or touching.
- *Vocal tics:* Usually grunts; coprolalia occurs in about 10% of cases.

Associated Problems. ADHD and obsessive-compulsive disorder are each present in about one-third of cases. ADHD occurs before tics whereas OCD symptoms occur after the tics.

Course. Lifelong, with remissions and exacerbations

Treatment. Antipsychotic drugs, including pimozide, haloperidol, olanzapine and risperidone are treatments of choice. Clonidine and clonazepam are sometimes useful.

Review Question

A 13-year-old boy is referred by his junior high school principal for evaluation of his short attention span and inability to sit quietly in class or on the school bus. He has a quick temper at school and at home, and his peers tease him about his temper.

Which of the following is most likely to be an associated finding in this case?

(A) Affectual blunting
(B) Autistic mannerisms
(C) Conduct disturbances
(D) Grandiosity and inflated self-esteem
(E) Mental retardation

Answer: C. The symptoms in this case are suggestive of ADHD. Conduct disturbances are a common associated finding in individuals with ADHD; drug abuse is also more common. Affect tends to be more labile, and low self-esteem is common. Although mental retardation is seen more often in children with ADHD than in the general population, it is not a common associated finding, and this boy is at the expected grade level for his age. Autism is rarely diagnosed in individuals with ADHD.

Mood Disorders 4

MAJOR DEPRESSIVE DISORDER (MAJOR DEPRESSION)

A 70-year-old woman was recently admitted after her son informed the doctor that she had been doing very poorly. The patient reports a 30-pound weight loss, decreased concentration, feelings of helplessness and hopelessness, decreased energy, depressed mood, and decreased sleep.

Definition. Mood disorder that presents with at least a 2-week course of symptoms that is a change from the patient's previous level of functioning. Must have depressed mood or anhedonia.

Risk Factors/Epidemiology. Major depression is seen more frequently in women due to several factors, such as hormonal differences, great stress, or simply a bias in the diagnosis. The typical age of onset is 40 years. There is also a higher incidence in those who have no close interpersonal relationships or are divorced or separated. Many studies have reported abnormalities in serotonin, norepinephrine, and dopamine. Other risk factors include family history, exposure to stressors, and behavioral reasons, such as learned helplessness.

Presenting Symptoms

- Depressed mood most of the day
- Anhedonia during most of the day
- Significant weight loss or weight gain
- Insomnia or hypersomnia
- Psychomotor agitation or retardation
- Fatigue or loss of energy nearly every day
- Feelings of worthlessness or guilt
- Diminished ability to concentrate
- Recurrent thoughts about death

Physical Examination. Usually within normal limits; however, may find evidence of psychomotor retardation, such as stooped posture, slowing of movements, slowed speech, etc. May also find evidence of cognitive impairment, such as decreased concentration and forgetfulness.

May also include:

- *Psychotic features:* Worse prognosis
- *Atypical features:* Increased weight, appetite, and sleep

Treatment. Must first secure the safety of the patient, given that suicide is such a high risk. Pharmacotherapy includes antidepressant medications such as SSRIs. Tricyclic antidepressants (TCAs), or monoamine oxidase inhibitors (MAOIs). Electroconvulsive therapy (ECT) may be indicated if patient is suicidal or worried about side effects from medications. Individual psychotherapy is indicated to help the patient deal with conflicts, sense of loss, etc. Another form of therapy is cognitive therapy, which will change the patient's distorted thoughts about self, future, world, etc.

Differential Diagnosis. *Medical disorders:* Hypothyroidism, Parkinson's disease, dementia, medications, pseudodementia, tumors, cerebrovascular accidents. *Mental disorders:* Other mood disorders, substance disorders, and grief.

BIPOLAR I DISORDER

> A 19-year-old college student is taken to the school counselor after he fails several classes. The patient is enrolled in numerous classes, most of which have conflicting times. His grades are poor, and he seems undisturbed by this. He is also enrolled in numerous organizations, such as the chess club, drama club, student government, sports, and at least two fraternities. His speech is pressured and he has psychomotor agitation.

Definition. A mood disturbance in which the patient typically experiences manic symptoms for at least 1 week that cause significant distress or impairment in his/her level of functioning.

Risk Factors/Epidemiology. Bipolar disorder affects men and women equally and has a mean age of onset of about 30 years. More prevalent among high socioeconomic status and those who did not finish college. Considered to be the illness with the greatest genetic linkage. Coexisting disorders may include anxiety, alcohol dependence, and substance-related disorders.

Presenting Symptoms

- Abnormal or persistently elevated mood lasting at least 1 week
- Increased self-esteem or grandiosity
- Distractibility
- Excessive involvement in activities
- More talkative than usual
- Psychomotor agitation
- Flight of ideas
- Increased sexual activity
- Increase in goal-directed activity

Physical Examination. Usually within normal limits; however, may find evidence of psychomotor agitation and pressured speech.

Treatment. Must assess patient safety to determine the need for hospitalization. Pharmacotherapy will include mood stabilizers, benzodiazepines, and antipsychotics. Individual psychotherapy is also indicated.

Differential Diagnosis

- *Mental disorders:* Schizophrenia, personality disorders
- *Medical disorders:* CNS infections, tumors, hyperthyroidism, and medications

PERSISTENT DEPRESSIVE DISORDER

Mr. Smith complains of poor appetite, low energy, poor concentration, and difficulty in making decisions, which affects his ability to complete his assignments at work. These symptoms have occurred for more than 2 years.

Definition. A chronic disorder characterized by a depressed mood that lasts most of the time during the day and is present on most days for at least 2 years.

Risk Factors/Epidemiology. The disorder is more common in women who are younger than 64 years of age as well as in those that are unmarried and young individuals from low-income families. Patients typically have other psychiatric disorders, such as anxiety, substance abuse, and/or borderline personality disorders.

Treatment. Hospitalization is usually not indicated in these patients. They benefit from long-term individual insight-oriented psychotherapy to help them overcome their long-term sense of despair and resolve conflicts from childhood. If medications are indicated, SSRIs, TCAs, or MAOIs are usually the choice.

Differential Diagnosis. Differential diagnosis is essentially the same as for major depression; however, must also consider minor depressive disorder and recurrent brief depressive disorder.

CYCLOTHYMIC DISORDER

Mrs. McDonald has experienced a 12-year history of periods of feeling great followed by periods of feeling lousy. During her feeling-great periods, she experiences increased sexual drive, euphoric mood, and increased irritability. During her feeling-lousy periods, she experiences insomnia, fatigue, and low self-esteem.

Definition. A chronic disorder characterized by many periods of depressed mood and many periods of hypomanic mood for at least 2 years.

Risk Factors/Epidemiology. Many of the patients have interpersonal and marital difficulties. It frequently coexists with borderline personality disorder and is seen more frequently in women. Many of the patients with this disorder have family histories of bipolar disorder. Alcohol and substance abuse are common.

Treatment. Antimanic drugs such as lithium, carbamazepine, and valproic acid are typically the drugs of choice. Psychotherapy will focus on helping the patients gain insight into their illness and how to cope with it.

Differential Diagnosis

- *Medical:* Seizures, substances, and medications
- *Mental:* Other mood disorders, personality disorders. medications again

SEASONAL AFFECTIVE DISORDER

A young woman from Minnesota complains of depressed mood and sleep disturbances every winter. Her symptoms resolve in the spring and summer.

Definition. A disorder characterized by depressive symptoms found during winter months and absent during summer months. Believed to be caused by abnormal melatonin metabolism (decreased MSH).

Treatment. Phototherapy

GRIEF, POSTPARTUM DEPRESSION, DEATH AND DYING

Grief

Table I-5-1. Grief Versus Depression

Grief or Bereavement	Depression
Sadness, tearfulness, decreased sleep, decreased appetite, decreased interest in the world	Sadness, tearfulness, decreased sleep, decreased appetite, decreased interest in the world
Symptoms wax and wane	Symptoms pervasive and unremitting
Shame and guilt less common	Shame and guilt are common
Threaten suicide less often	Threaten suicide more often
Symptoms can last up to one year	Symptoms continue for more than one year
Usually return to baseline level of functioning within 2 months	Patients do not return to baseline level of functioning
Treatment includes supportive psychotherapy	Treatment includes antidepressant medication

Postpartum Depression

Table I-5-2. Postpartum Blues Versus Depression Versus Psychosis

	Postpartum Blues or "Baby Blues"	Postpartum Depression	Postpartum Psychosis
Baby	**Any**	**Usually 2nd**	**Usually 1st**
Onset	Begins after birth and lasts up to 2 weeks	Begins within 1 month of birth and symptoms may continue	Begins within 1 month of birth and symptoms may continue
Mother cares about baby	Yes	May have thoughts about hurting the baby	May have thoughts about hurting the baby
Symptoms	Mild depressive	Severe depressive	Severe depressive and psychotic symptoms
Treatment	Self-limited; no treatment necessary	Antidepressants	Antidepressants and mood stabilizers or antipsychotics

Death and Dying

Based on the stages identified by Elisabeth Kubler-Ross. She believed dying patients did not follow a regular series of responses that could be easily identified. She believed most individuals experience stages that are common reactions to death. These stages do not have to occur in order.

Stage 1: Shock and denial
Stage 2: Anger
Stage 3: Bargaining
Stage 4: Depression
Stage 5: Acceptance

Review Questions

1. A 50-year-old woman is taken to the hospital after neighbors find her wandering the streets mumbling to herself and gesturing. When approached, she begins to cry and expresses thoughts about hurting herself. Examination reveals scratch marks on both her forearms and questionable lacerations on her throat. When questioned, she reports feeling depressed since her husband died 5 months ago. She reports a decrease in concentration and feelings of helplessness, hopelessness, and anhedonia, which resulted in her quitting her job and staying at home. She now has begun to hear her husband's voice asking her to "join" him. Which of the following would be the next step in the management of this patient?

   (A) Begin a trial of antidepressant medications
   (B) Refer to psychiatry
   (C) Refer for electroconvulsive therapy
   (D) Assess for thoughts about suicide
   (E) Refer to the outpatient department for follow-up

(*Continued*)

Review Questions (*continued*)

2. Assuming you decide to begin treatment, which of the following is most indicated as the initial treatment?

   (A) Individual psychotherapy
   (B) Behavioral therapy
   (C) Fluoxetine
   (D) Risperidone
   (E) Phenelzine

3. A 32-year-old woman was recently diagnosed with breast cancer. Which of the following would you expect to see first?

   (A) Shock and denial
   (B) Anger
   (C) Bargaining
   (D) Depression
   (E) Any of the above

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1. **Answer: D.** The most important thing to assess in patients suffering from depression is their suicidal status, which of course determines her prognosis and whether or not you will admit her to the hospital for treatment. You will probably begin a course of pharm-acotherapy, but you need to assess suicidal status first. "Refer to psychiatry" will always be wrong on a test, given that you need to know what to do in these situations. Electroconvulsive therapy might be indicated in her condition but is usually not the first line of treatment.
2. **Answer: D.** Patients with both mood and psychotic symptoms respond to both antidepressants as well as to antipsychotic medication. However, you must treat the worst symptom first. In this case, the antipsychotic would be most indicated to reduce her psychotic symptoms. Choice D is an atypical antipsychotic medication with minimal side effects.
3. **Answer: E.** Because the stages can occur in any order, any one of the above is the answer.

Schizophrenia and Other Psychotic Disorders

5

Definition. Schizophrenia is a thought disorder that impairs judgment, behavior, and ability to interpret reality. Symptoms must be present for a period of at least 6 months to be able to make a diagnosis.

Risk Factors/Etiology. Men have an earlier onset, usually at 15 to 25 years of age. Many theories have evolved regarding the cause of schizophrenia. Schizophrenia has been associated with high levels of dopamine and abnormalities in serotonin. Because there is an increase in the number of schizophrenics born in the winter and early spring, many believe it may be viral in origin. Schizophrenia is more prevalent in the low socioeconomic status (SES) groups, either as a result of downward drift or social causation.

Prevalence

General population..... 1%	One schizophrenic parent.....12%
Monozygotic twin..... 47%	Two schizophrenic parents 40%
Dizygotic twin..... 12%	First-degree relative.....12%
	Second-degree relative 5–6%

Physical and Psychiatric Presenting Symptoms

- Hallucinations (mostly auditory)
- Delusions (mostly bizarre)
- Disorganized speech or behavior
- Catatonic behavior
- Negative symptoms
- Usually experience social and or occupational dysfunction
- Physical exam usually unremarkable, but may find saccadic eye movements, hypervigilance, etc.

Brain Imaging Findings

- *Computed tomography (CT):* Lateral and third **ventricular enlargement**, **reduction in cortical volume** (associated with the presence of negative symptoms, neuropsychiatric impairment, increased neurologic signs, and poor premorbid adjustment)
- *Magnetic Resonance Imaging (MRI):* Increased cerebral ventricles
- *Positron emission tomography (PET):* Hypoactivity of the frontal lobes and hyperactivity of the basal ganglia relative to the cerebral cortex

Psychologic Tests

- *IQ tests:* Will score lower on all IQ tests, maybe due to low intelligence at the onset or to deterioration as a result of the disease
- *Neuropsychologic:* Tests usually are consistent with bilateral frontal and temporal lobe dysfunction, including deficits in attention, retention time, and problem-solving ability.
- *Personality:* May give abnormal findings, such as bizarre ideations, etc.

Treatment. Hospitalization is usually recommended for either stabilization or safety of the patient. If you decide to use medications, antipsychotic medications are most indicated to help control both positive and negative symptoms. If no response, consider using clozapine after other medications have failed. The suggested psychotherapy will be supportive psychotherapy with the primary aim of having the patient understand that the therapist is trustworthy and has an understanding of the patient, no matter how bizarre.

Differential Diagnosis

- *Substance-induced:* Psychostimulants, hallucinogens, alcohol hallucinosis, barbiturate withdrawal, etc. Consider urine drug screen to rule out.
- *Epilepsy:* Temporal lobe epilepsy
- *Other psychotic disorders:* Schizoaffective, schizophreniform, brief reactive psychosis, delusional disorder
- *Malingering and factitious disorder:* Must assess whether the patient is in control of the symptoms and whether there is an obvious gain
- *Mood disorders:* Look at duration of mood symptoms; these tend to be brief in schizophrenia.
- *Medical:* HIV, steroids, tumors, CVAs, etc. Need medical work-up to rule out.
- *Personality disorders:* Schizotypal, schizoid, and borderline personality disorders have the most similar symptoms. Must look at duration of symptoms as well as patient's level of functioning.

OTHER PSYCHOTIC DISORDERS

Brief Psychotic Disorder

A 35-year-old female Chinese immigrant is brought in by neighbors after she was found wandering in the streets yelling out someone's name. She appears disheveled and grossly disorganized. You learn that she arrived in the U.S. several days ago and upon her arrival, witnessed the death of her 3-year-old son. While in the waiting room, she appears to be responding to internal stimuli.

Presenting Symptoms

- Hallucinations
- Delusions
- Disorganized speech
- Grossly disorganized or catatonic behavior
- Symptoms more than one day but less than 30 days

Risk Factors. Seen most frequently in the low socioeconomic status as well as in those who have preexisting personality disorders or the presence of psychological stressors.

Treatment. Hospitalization is warranted if the patient is acutely psychotic, to assure the safety of her/himself or of others. Pharmacotherapy will include both antipsychotics and benzodiazepines. The benzodiazepines may be used for short-term treatment of psychotic symptoms.

Schizophreniform Disorder

> Mrs. Jones is evaluated at a nearby clinic after she was noticed to be acting inappropriately at work. According to her coworkers, she began acting strangely 3 months ago. At that time she began wearing a hard hat to work and when asked why, replied, "I will not let you read my mind." She also believed that others were talking about her and routinely asked them to stop. On several occasions, she had to be escorted out of the room because she started to argue with others whom she believed were controlling her mind.

Presenting Symptoms

- Hallucinations
- Delusions
- Disorganized speech
- Grossly disorganized or catatonic behavior
- Negative symptoms
- Social and/or occupational dysfunction
- Symptoms are present more than one month but less than 6 months
- Most of the patients return to their baseline level of functioning

Risk Factors. Suicide is a risk factor given that the patient is likely to have a depressive episode after the psychotic symptoms resolve.

Treatment. Must assess whether the patient needs hospitalization, to assure safety of patient and/or others.

Antipsychotic medication is indicated for a 3–6-month course. Individual psychotherapy may be indicated to help the patient assimilate the psychotic experience into his/her life.

Schizoaffective Disorder

> A 25-year-old woman is found walking nude in the shopping mall. When asked why, she replies, "I am making it easy for others to have sex with me since I know they all want me." She states she heard a voice telling her she was irresistible and everyone wanted her. When she speaks, she cannot focus on one topic at a time and frequently jumps from one topic to another. Her mood is described as euphoric and her affect labile. She recounts an episode last year where she heard voices she could not describe and believed others were following her. These symptoms lasted for more than 6 months and caused her to lose her job.

Presenting Symptoms

- Uninterrupted period of symptoms meeting criteria for major depressive episode, manic episode, or mixed episode
- Symptoms for schizophrenia
- Delusions or hallucinations for at least 2 weeks in the absence of mood symptoms

Prognosis. Better prognosis than patients with schizophrenia. Worse prognosis than patients with affective disorders.

Treatment. Must first determine whether hospitalization is necessary. Use antidepressant medications and/or anticonvulsants to control the mood symptoms. If these are not effective, consider the use of antipsychotic medications to help control the ongoing symptoms.

Delusional Disorder

> Mr. Smith has been married for approximately 10 years, and during most of those years, he believed his wife was trying to poison him to get his money. He frequently complains of stomach pains, which he believes are due to the poison in the food. His thoughts are logical and coherent. He denies any hallucinations. His wife, an independently wealthy woman, does not understand her husband's logic because she has more money than he does.

Presenting Symptoms

- Nonbizarre delusions for at least one month
- No impairment in level of functioning
- The patients are usually reliable unless it is in relationship to their delusions.
- Types include erotomanic, jealous, grandiose, somatic, mixed, unspecified.

Risk Factors. Mean age of onset is about 40 years. Seen more commonly in women, and most of these patients are married and employed. Delusional disorder has been associated with low socioeconomic status as well as recent immigration.

Can usually see conditions in either the limbic system or basal ganglia, if medical causes are determined to be the cause of the delusions.

Treatment. Outpatient treatment is usually preferred, but the patient may need hospitalization while you rule out medical causes for the delusional disorder. Pharmacotherapy consists of antipsychotic medications; however, most studies indicate that many patients do not respond to treatment. Individual psychotherapy is recommended, in which the focus would be on having the patient trust the physician so the physician can point out to the patient how the delusions both are distressing and interfere with normal life.

Review Questions

1. A 23-year-old woman was seen today after she complained that her neighbors were talking about her. According to the neighbors, her behavior started 3 weeks ago after she was involved in a car accident. Since then, she has been following the neighbors for several days and harassing them at work. She believes that the neighbors are putting poison in her food and want to kill her. When asked why, she is unable to give a clear explanation but insists that what she is saying is true. She states that the voice in her head told her it is true and that you should stop asking questions. While in the waiting room, you observe her to be dressed bizarrely and laughing inappropriately. Which of the following is most indicated in the management of this patient?

   (A) Haloperidol
   (B) Clozapine
   (C) Lorazepam
   (D) Risperidone
   (E) Fluphenazine decanoate

2. If her symptoms do not improve within the next week, which of the following is she at greatest risk of developing?

   (A) Schizophrenia, paranoid type
   (B) Schizoaffective disorder
   (C) Schizophreniform disorder
   (D) Schizotypal personality disorder
   (E) Delusional disorder

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1. **Answer: D.** The patient clearly has psychotic symptoms; therefore, you would want to give her medication with the least amount of side effects. Choices A and E are typical antipsychotics with many side effects. Choices B and D are atypical antipsychotics; however, clozapine is not used first line in the treatment of psychotic symptoms. Lorazepam is not an antipsychotic medication. However, it can be used in psychotic patients to reduce agitation.

2. **Answer: C.** Because her symptoms have occurred for only three weeks, this patient has a diagnosis of brief psychotic disorder. But should the symptoms persist for more than one month, her diagnosis would be schizophreniform disorder. Schizophrenia is given when the symptoms are present for more than six months.

6 Anxiety Disorders

Definition. Anxiety is a syndrome with psychologic and physiologic components. Psychologic components include worry that is difficult to control, hypervigilance and restlessness, difficulty concentrating, and sleep disturbance. Physiologic components include autonomic hyperactivity and motor tension.

Risk Factors/Etiology. Psychodynamic theory posits that anxiety occurs when instinctual drives are thwarted. Behavioral theory states that anxiety is a conditioned response to environmental stimuli originally paired with a feared situation. Biologic theories implicate various neurotransmitters (especially gamma-aminobutyric acid [GABA], norepinephrine, and serotonin) and various CNS structures (especially reticular activating system and limbic system).

PANIC DISORDER

Definition. Recurrent, unexpected panic attacks are present. Panic attacks are attacks of intense anxiety that often include marked physical symptoms, such as tachycardia, hyperventilation, dizziness, and sweating. Attacks followed by 1 month of fear of having no attacks, changing behavior, etc.

Risk Factors/Etiology. History associated with panic disorder includes separations during childhood and interpersonal loss in adulthood. A majority of individuals with panic disorder, unlike other individuals, have panic symptoms in response to "panicogens" (lactate CO_2, yohimbine, caffeine, and other substances). Studies of twins suggest a genetic component.

Presenting Symptoms

- *Prevalence:* 2% of the population. Occurs at a 1:2 male-to-female ratio.
- *Onset:* Often during the third decade
- *Course:* Severity of symptoms may wax and wane, and may be associated with intercurrent stressors.
- *Key symptoms:* Attacks usually last a few minutes.
- *Associated problems:* Depression, generalized anxiety, and substance abuse
- *Agoraphobia:* Fear or avoidance of places from which escape would be difficult in the event of panic symptoms (public places, being outside alone, public transportation, crowds). More common in women. Often leads to severe restrictions on the individual's travel and daily routine.

Treatment. Pharmacologic interventions include SSRIs, alprazolam, clonazepam, imipramine, and MAOIs (e.g., phenelzine). Psychotherapeutic interventions include relaxation training for panic attacks and systematic desensitization for agoraphobic symptoms.

PHOBIC DISORDERS

Definition. Irrational fear and avoidance of objects and situations

Types of Phobias

- *Specific phobia:* Fear or avoidance of objects or situations other than agoraphobia or social phobia. Commonly involves animals (e.g., carnivores, spiders), natural environments (e.g., storms), injury (e.g., injections, blood), and situations (e.g., heights, darkness).
- *Social phobia:* Fear of humiliation or embarrassment in either general or specific social situations (e.g., public speaking, "stage fright," urinating in public restrooms).

Treatment. Cognitive-behavioral therapies for phobias include systematic desensitization and assertiveness training. Pharmacotherapy includes SSRIs, buspirone, and beta-blockers (for stage fright).

OBSESSIVE-COMPULSIVE DISORDER (OCD)

Definition. OCD is characterized by recurrent obsessions or compulsions that are recognized by the individual as unreasonable. Obsessions are anxiety-provoking, intrusive thoughts, commonly concerning contamination, doubt, guilt, aggression, and sex. Compulsions are peculiar behaviors that reduce anxiety, commonly hand-washing, organizing, checking, counting, and praying.

Risk Factors/Etiology. May be associated with abnormalities of serotonin metabolism

Presenting Symptoms

- *Prevalence:* 2% of population. Occurs at a 1:1 male-to-female ratio.
- Some evidence of heritability
- *Onset:* Insidious and occurs during childhood, adolescence, or early adulthood
- *Course:* Symptoms usually wax and wane, and depression, other anxieties, and substance abuse are common.

Physical Examination. Chapped hands when hand-washing compulsion is present.

Treatment. Behavioral psychotherapies are relaxation training, guided imagery, exposure, paradoxical intent, response prevention, thought-stopping techniques, and modeling. Pharmacotherapy includes selective serotonin reuptake inhibitors, TCAs, MAOIs, and SNRIs.

ACUTE STRESS DISORDER AND POST-TRAUMATIC STRESS DISORDER

Definition. These disorders are characterized by severe anxiety symptoms and follow a threatening event that caused feelings of fear, helplessness, or horror. When this anxiety lasts less than 1 month (but greater than 2 days) and symptoms occur within 1 month of stressor, it is diagnosed as acute stress disorder (ASD). When the anxiety lasts longer than 1 month, it is diagnosed as post traumatic stress disorder (PTSD).

Risk Factors/Etiology. Traumatic events precipitate ASD and PTSD. Premorbid factors, such as personality traits, play an uncertain role.

Presenting Symptoms

- May occur at any age. About 50% of cases resolve within 3 months.
- Usually begin immediately after trauma, but may occur after months or years.
- Three key symptom groups
  - Reexperiencing of the traumatic event: dreams, flashbacks, or intrusive recollections
  - Avoidance of stimuli associated with the trauma, or numbing of general responsiveness
  - Increased arousal: anxiety, sleep disturbances, hypervigilance
- Anxiety, depression, impulsivity, and emotional lability are common.
- *"Survivor guilt":* A feeling of irrational guilt about an event sometimes occurs.

Treatment. Counseling after a stressful event may prevent PTSD from developing. Group psychotherapy with other survivors is helpful. Pharmacotherapy includes SSRIs, other antidepressants, and benzodiazepines. Prazosin has been used to reduce nightmares.

GENERALIZED ANXIETY DISORDER

Definition. Excessive, poorly controlled anxiety about life circumstances that continues for more than 6 months. Both psychologic and physiologic symptoms of anxiety are present. General worry is accompanied by somatic symptoms such as irritability, decreased sleep, and poor concentration.

Risk Factors/Etiology. May be a genetic predisposition for an anxiety trait

Presenting Symptoms

- *Prevalence:* 5% of the population. Occurs at a 2:3 male-to-female ratio.
- *Onset:* Often during childhood but can occur later
- *Course:* Usually chronic, but symptoms worsen with stress
- *Associated problems:* Depression, somatic symptoms, and substance abuse

Treatment. Behavioral psychotherapy includes relaxation training and biofeedback. Pharmacotherapy includes SSRIs, venlafaxine, buspirone, and benzodiazepines.

Review Question

A 31-year-old local politician has a sudden onset of extreme anxiety, tremulousness, and diaphoresis immediately before his first scheduled appearance on national television, and he is unable to go on the air. For the next week he is paralyzed by fear each time he faces an audience, and he cancels all of his scheduled public appearances.

Which of the following is the most likely diagnosis?

(A) Acute stress disorder
(B) Adjustment disorder with anxious mood
(C) Panic disorder
(D) Social phobia
(E) Specific phobia

Answer: D. This presentation is most suggestive of social phobia. In this case, exposure to public speaking precipitated a panic attack. Panic disorder is also characterized by panic attacks; however, there is no clear precipitant. Specific phobia, situational type, is a less likely diagnosis, because there is no specific cause of the fear other than social exposure. Acute stress disorder is characterized by the presence of intrusive recollections and emotional numbing that follow a severely stressful event. Adjustment disorder with anxious mood is characterized by an adaptation problem that follows a psychologic stressor, of which there is no evidence in this case.

Somatic Symptom and Related Disorders

7

Definition. Somatoform disorders are characterized by the presentation of physical symptoms with no medical explanation(s). The symptoms are severe enough to interfere with the patient's ability to function in social or occupational activities.

SOMATIC SYMPTOM DISORDER

> Mrs. Smith has been married for approximately 10 years, and during all of those years she remembers being sick all of the time. According to her husband, she constantly takes medications for all of her ailments. She has visited numerous physicians and none have been able to correctly diagnose her condition. Today she presents in your office complaining of shortness of breath, chest pain, abdominal pain, back pain, double vision, difficulty walking due to weakness in her legs, headaches, constipation, bloating, decreased libido, and tingling.

Definition. A disorder where one or more somatic symptoms that are distressing result in problems in functioning.

Risk Factors/Etiology. Somatization disorder affects women more than men and is usually inversely related to SES. Usually begins by the age of 30. Data suggest that there may be a genetic linkage to the disorder. Within families, male relatives tend to have antisocial personality disorder, whereas female relatives tend to have histrionic personality disorder.

Physical and Psychiatric Presenting Symptoms

- Many physical symptoms affecting many organ systems
- Excessive thoughts, feelings, or behaviors related to the somatic symptoms
- Long, complicated medical histories
- Interpersonal and psychologic problems are usually present.
- Patients will usually seek out treatment and have significant impairment in their level of functioning.
- Commonly associated with major depressive disorder, personality disorders, substance-related disorders, generalized anxiety disorders, and phobias

Treatment. Must have a single identified physician as the primary caretaker. Patient should be seen during regularly scheduled brief monthly visits. Should increase the patient's awareness of the possibility that the symptoms are psychological in nature. Individual psychotherapy is needed to help patients cope with their symptoms and develop other ways of expressing their feelings.

Differential Diagnosis

- *Medical:* MS, myasthenia gravis, SLE, AIDS, thyroid, and chronic systemic infections
- *Psychiatric:* Major depression, generalized anxiety disorder, schizophrenia

CONVERSION DISORDER

A recently married woman presents to the emergency department unable to move her lower extremities. A full workup is done, and no abnormalities are found. When further questioned, she reports being beaten by her husband on a regular basis.

Definition. A disorder in which the individual experiences one or more neurologic symptoms that cannot be explained by any medical or neurologic disorder.

Risk Factors/Etiology. Seen more frequently in young women. Also more common among the lower SES, rural populations, low IQs, and military personnel. Commonly associated with passive-aggressive, dependent, antisocial, and histrionic personality disorder.

Psychiatric and Physical Presenting Symptoms

- One or two neurologic symptoms affecting voluntary or sensory function
- Must have psychologic factors associated with the onset or exacerbation of the symptoms
- Mutism, blindness, and paralysis are the most common symptoms.
- *Sensory system:* Anesthesia and paresthesia
- *Motor system:* Abnormal movements, gait disturbance, weakness, paralysis, tics, jerks, etc.
- *Seizure system:* Pseudoseizures
- *Primary gain:* Keeps internal conflicts outside patient's awareness
- *Secondary gain:* Benefits received from being "sick"
- *La belle indifference:* Patient seems unconcerned about impairment.
- *Identification:* Patients usually model their behavior on someone who is important to them.

Treatment. Psychotherapy to establish a caring relationship with treater and focus on stress and coping skills. Brief monthly visits with partial physical examinations.

Differential Diagnosis

- *Neurologic:* Dementia, tumors, basal ganglia disease, and optic neuritis
- *Psychiatric:* Schizophrenia, depressive disorders, anxiety disorders, factitious
- *Other:* Malingering

ILLNESS ANXIETY DISORDER

A 22-year-old woman presents to the doctor convinced that there is something wrong with her. She reports frequent headaches that are not alleviated with aspirin. She has been to numerous physicians and all have told her that there is nothing wrong with her. She expects that you can help her because she knows that there is something wrong and that you can adequately treat her condition.

Definition. A disorder characterized by the patient's belief that he/she has some specific disease. Despite constant reassurance, the patient's belief remains the same. Symptoms must occur for >6 months.

Risk Factors/Etiology. Men and women are affected equally. Most common onset is between the ages of 20 and 30.

Physical and Psychiatric Presenting Symptoms

- Preoccupation with diseases
- The preoccupation persists despite constant reassurance by physicians.
- The belief is not delusional.
- The preoccupation affects the individual's level of functioning.
- Duration at least 6 months

Treatment. Psychotherapy to help relieve stress and help cope with illness. Frequent, regularly scheduled visits to patient's medical doctor(s).

BODY DYSMORPHIC DISORDER

The mother of a 20-year-old man presents to your office in tears. She insists that you come to her house and see her son, who has been homebound for several years. She tells you that her son refuses to leave the house because he believes he is ugly and people will laugh at him. He feels deformed and refuses to let others see him. When you arrive at the house, you find an attractive young man with no observable deformities.

Definition. A disorder characterized by the belief that some body part is abnormal, defective, or misshapen.

Risk Factors/Etiology. Affects women more than men, typically between the ages of 15 and 20. These women are unlikely to be married. Other disorders that may be found include depressive disorders, anxiety disorders, and psychotic disorders. Family history of depressive disorders and OCDs. May involve serotonergic systems.

Physical and Psychiatric Presenting Symptoms

- Most common concerns involve facial flaws
- Constant mirror-checking
- Attempt to hide the alleged deformity

- Housebound
- Avoids social situations
- Causes impairment in their level of functioning

Treatment. Individual psychotherapy to help deal with stress of alleged imperfections as well as reality testing. Pharmacotherapy may include the use of SSRIs, TCAs, or MAOIs.

Differential Diagnosis

- *Medical:* Some types of brain damage, such as neglect syndrome
- *Psychiatric:* Anorexia, narcissistic personality disorder, OCD, schizophrenia, delusional disorder

FACTITIOUS DISORDER

A 2-year-old girl was hospitalized after her mother complained that the girl had multiple episodes of apnea in the middle of the night. The mother was given an apnea monitor to take home and when she returned, there were numerous episodes registering on the monitor. While in the hospital, the girl had no episodes of apnea. However, shortly after her mother's visit, there were numerous episodes recorded on the monitor.

Definition. A disorder characterized by the conscious production of signs and symptoms of both medical and mental disorders. The main objective is to assume the sick role and eventually hospitalization. Usually diagnosed with physical or psychological symptoms or both. Consists of 2 main types: **imposed on self** and **imposed on others**.

Etiology. Seen more commonly in women and in hospital and health care workers. As children, many of the patients suffered abuse that resulted in frequent hospitalizations, thus their need to assume the sick role.

Physical and Psychiatric Presenting Symptoms

- Typically demand treatment when in the hospital
- If tests return negative, they tend to accuse doctors and threaten litigation.
- Become angry when confronted

Treatment. Usually involves management rather than cure. Must be aware of countertransference when the physician suspects factitious disorder.

Differential Diagnosis. Psychiatric: Other somatoform disorders, antisocial personality disorder, histrionic personality disorder, schizophrenia, substance abuse, malingering, and Ganser's syndrome

MALINGERING

A 40-year-old homeless man presents to the hospital on a cold night complaining of auditory hallucinations telling him to kill himself. When asked about past psychiatric history, he is unable to give any detailed information. He seems concerned about being admitted immediately and refuses all medications, when offered.

Definition. Characterized by the conscious production of signs and symptoms for an obvious gain (money, avoidance of work, free bed and board, etc.). It is not a mental disorder.

Risk Factors/Etiology. Seen more frequently in men, especially in prisons, factories, the military, etc.

Physical and Psychiatric Presenting Symptoms

- Most express subjective symptoms.
- Tend to complain a lot and exaggerate its effect on their functioning and lives
- Preoccupied more with rewards than with alleviation of symptoms

Treatment. Allow the patient to save face by not confronting the patient and by allowing the physician–patient relationship to work. If confronted, patient will become angry and more guarded and suspicious.

Differential Diagnosis. Psychiatric: somatoform disorders

Review Question

A 40-year-old woman presents to your office and demands to be seen immediately. She schedules appointments to see you on a regular basis as well as irregularly. She routinely goes to the emergency department when she knows you are in the hospital. She calls your service every night and demands that you call her at home. Her frequent complaints include headache, shortness of breath, double vision, burning at urination, weakness in her arms and legs, tingling in her fingers, and palpitations. All of her medical workup has been negative so far. Which of the following would be the next step in the management of this patient?

(A) Tell her it is all in her head
(B) Assure her there is nothing wrong with her
(C) Refer her to a psychiatrist
(D) Begin a trial of lorazepam
(E) Schedule regular office visits

Answer: E. Patients with somatoform disorders must have only one physician, and this physician must continue to see them on a regular basis, given that it is possible that they may have something physically wrong in the future. However, by limiting their care to one physician, you reduce the amount of tests and medications that get administered. Strict limit-setting is essential for these patients.

Neurocognitive Disorders 8

Cognition includes memory, language, orientation, judgment, problem solving, interpersonal relationships, and performance of actions. Cognitive disorders have problems in these areas as well as behavioral symptoms.

Definition. Characterized by the syndromes of delirium, neurocognitive disorder, and amnesia, which are caused by general medical conditions, substances, or both.

Risk Factors/Etiology. Very young or advanced age, debilitation, presence of specific general medical conditions, sustained or excessive exposure to a variety of substances.

Presenting Symptoms (Key Symptoms)

- Memory impairment, especially recent memory
- *Aphasia:* Failure of language function
- *Apraxia:* Failure of ability to execute complex motor behaviors
- *Agnosia:* Failure to recognize or identify people or objects
- *Disturbances in executive function:* Impairment in the ability to think abstractly and plan such activities as organizing, shopping, and maintaining a home

DELIRIUM

Definition. Delirium is characterized by prominent disturbances in alertness, confusion, and a short and fluctuating course. It is caused by acute metabolic problems or substance intoxication.

Risk Factors/Etiology. Commonly associated with general medical conditions such as systemic infections, metabolic disorders, hepatic and renal diseases, seizures, and head trauma. Also associated with high, sustained, or rapidly decreasing levels of many drugs, especially in elderly and severely ill individuals.

Presenting Symptoms. Delirium occurs in >40% of elderly, hospitalized patients. Key symptoms include agitation or stupor, fear, emotional lability, hallucinations, delusions, and disturbed psychomotor activity.

Physical Examination. Motor abnormalities commonly present include incoordination, tremor, asterixis, and nystagmus. Incontinence is common. There is often evidence of underlying general medical conditions or substance-specific syndromes.

Diagnostic Tests. EEG often shows either generalized slowing of activity, fast-wave activity, or focal abnormalities. Abnormal findings from neuroimaging and neuropsychiatric testing may be present.

Treatment. Correction of physiologic problems is essential. Frequent orientation and reassurance are helpful. Protective use of physical restraints and antipsychotic medications should be considered.

Differential Diagnosis. Neurocognitive disorder, substance intoxication or withdrawal, and psychotic disorders are the major rule-outs.

NEUROCOGNITIVE DISORDER

Definition. Neurocognitive disorder is characterized by prominent memory disturbances coupled with other cognitive disturbances that are present even in the absence of delirium. It is caused by CNS damage and likely to have a protracted course.

Risk Factors/Etiology. Neurodegenerative disease such as Alzheimer, Parkinson, Huntington, Pick, and other fronto-temporal degeneration, and Creutzfeldt-Jakob disease are common. Cerebrovascular disease, intracranial processes such as CNS infections (e.g., HIV), traumatic brain injuries, radiation, and/or tumors should be considered. Seizure disorders, metabolic disorders (e.g., disease of protein, lipid, and carbohydrate metabolism; diseases of myelin; Wilson disease; uremic encephalopathy), and endocrinopathies (e.g., hypothyroidism) are often associated with neurocognitive disorder. Nutritional deficiencies, including beriberi (thiamine [vitamin B1] deficiency), pellagra (niacin deficiency), and/or pernicious anemia (cobalamin [vitamin B12] deficiency), should be considered. Toxins that cause neurocognitive disorder include alcohol, inhalants, sedative–hypnotics, anxiolytics, anticonvulsants, antineoplastic medications, heavy metals, insecticides, and solvents.

Prevalence. 5% of the population over 65 years of age and more than 20% of the population over 85 years of age

Heritability. Some types of neurodegenerative neurocognitive disorders (e.g., Huntington disease).

Key Symptoms. Increasing disorientation, anxiety, depression, emotional lability, personality disturbances, hallucinations, and delusions

Associated Findings. Abnormal findings from neuroimaging and neuropsychiatric testing.

Course. Depending on the etiology, function may stabilize or deteriorate further.

Physical Examination. Evidence of CNS motor pathology is often present. There may be evidence of underlying general medical conditions or substance-specific syndromes.

Diagnostic Tests. EEG may show specific focal abnormalities. Neuroimaging and neuropsychiatric testing may show specific abnormal findings. Folstein Mini-Mental Status Exam is used to detect neurocognitive disorder. Basic laboratory examination for neurocognitive disorder includes B12 and folate levels, RPR, CBC with SMA, and thyroid function tests.

Treatment. Correction or amelioration of underlying pathology is essential. Medication that further impairs cognition should be avoided. Provision of familiar surroundings, reassurance, and emotional support is often helpful.

Differential Diagnosis. Delirium and less severe, age-related cognitive decline must be ruled out.

Specific Neurocognitive Disorders

Neurocognitive disorder of the Alzheimer type

- Occupy more than 50% of nursing-home beds
- Found in 50–60% of patients with neurocognitive disorder
- Risk factors: Female, family history, head trauma, Down syndrome
- Neuroanatomic findings: Cortical atrophy, flattened sulci, and enlarged ventricles
- Histopathology: Senile plaques (amyloid deposits), neurofibrillary tangles, neuronal loss, synaptic loss, and granulovacuolar degeneration of neurons
- Associated with chromosome #21 (gene for the amyloid precursor protein)
- Decreased Ach and NE
- Deterioration is generally gradual, with average duration from onset to death being about 8 years.
- Focal neurologic symptoms are rare.
- Treatment includes long-acting cholinesterase inhibitors such as donepezil, rivastigmine, galantamine, and memantine..
- Antipsychotic medications may be helpful when psychotic symptoms present but contraindicated to control behavior.

Vascular neurocognitive disorder (multi-infarct neurocognitive disorder)

- Found in 15–30% of patients with neurocognitive disorder
- Risk factors: Male, advanced age, hypertension, or other cardiovascular disorders
- Affects small and medium-sized vessels
- Examination may reveal carotid bruits, fundoscopic abnormalities, and enlarged cardiac chambers.
- MRI may reveal hyperintensities and focal atrophy suggestive of old infarctions.
- Deterioration may be stepwise or gradual, depending on underlying pathology.
- Focal neurologic symptoms (pseudobulbar palsy, dysarthria, and dysphagia are most common)
- Abnormal reflexes and gait disturbance are often present.
- Treatment is directed toward the underlying condition and lessening cell damage.
- Control of risk factors such as hypertension, smoking, diabetes, hypercholesterolemia, and hyperlipidemia is useful.

Table I-9-1. Alzheimer Versus Vascular Neurocognitive Disorder

Alzheimer	Vascular
Women	Men
Older age of onset	Younger than Alzheimer patients
Chromosome 21	Hypertension
Linear or progressive deterioration	Stepwise or patchy deterioration
No focal deficits	Focal deficits
Supportive treatment	Treat underlying condition

Frontal temporal disease

- Neuroanatomic findings: Atrophy in the frontal and temporal lobes
- Histopathology: Pick bodies (intraneuronal argentophilic inclusions) and Pick cells (swollen neurons) in affected areas of the brain
- Etiology is unknown.
- Most common in men with family history of Pick disease
- Difficult to distinguish from Alzheimer's
- May see features of Klüver-Bucy syndrome (hypersexuality, hyperphagia, passivity)

Prion disease

- Rare spongiform encephalopathy is caused by a slow virus (prion).
- Presents with neurocognitive disorder, myoclonus, and EEG abnormalities (e.g., sharp, triphasic, synchronous discharges and, later, periodic discharges)
- Symptoms progress over months from vague malaise and personality changes to neurocognitive disorder and death.
- Findings include visual and gait disturbances, choreoathetosis or other abnormal movements, and myoclonus.
- Other prions that cause neurocognitive disorder (e.g., Kuru) may exist.

Huntington disease

- A rare, progressive neurodegenerative disease that involves loss of GABA-ergic neurons of the basal ganglia, manifested by choreoathetosis, neurocognitive disorder, and psychosis.
- Caused by a defect in an autosomal dominant gene located on chromosome 4
- Atrophy of the caudate nucleus, with resultant ventricular enlargement, is common.
- Clinical onset usually occurs at approximately age 40.
- Suicidal behavior is fairly common.

Parkinson disease

- Common, progressive, neurodegenerative disease involving loss of dopaminergic neurons in the substantia nigra
- Clinical onset is usually age 50–65.
- Motor symptoms include resting tremor, rigidity, bradykinesia, and gait disturbances.
- Neurocognitive disorder occurs in 40% of cases, and depressive symptoms are common.
- Destruction of dopaminergic neurons in the substantia nigra is a key pathogenic component and may be caused by multiple factors, including environmental toxins, infection, genetic predisposition, and aging.
- Treatment of Parkinson disease involves use of dopamine precursors (e.g., levodopa, carbidopa), dopamine agonists (e.g., bromocriptine), anticholinergic medications (e.g., benztropine, trihexyphenidyl), amantadine, and selegiline.
- Antiparkinsonian medications can produce personality changes, cognitive changes, and psychotic symptoms.

Lewy body disease

Hallucinations, parkinsonian features, and extrapyramidal signs. Antipsychotic medications may worsen behavior. Patients typically have fluctuating cognition, as well as REM sleep behavior disorder.

Note

(LBD) 1 yr ← PD → 1 yr (PDD)

HIV-related Neurocognitive Disorder (HIV encephalopathy)

- HIV directly and progressively destroys brain parenchyma.
- Becomes clinically apparent in at least 30% of individuals with AIDS, beginning with subtle personality changes.
- Diffuse and rapid multifocal destruction of brain structures occurs, and delirium is often present.
- Motor findings include gait disturbance, hypertonia and hyperreflexia, pathologic reflexes (e.g., frontal release signs), and oculomotor deficits.
- Mood disturbances in individuals with HIV infection are apathy, emotional liability, or behavioral disinhibition.

Wilson disease

- Ceruloplasmin deficiency
- Hepatolenticular degeneration
- Kayser-Fleischer rings in the eye
- Asterixis

Normal pressure hydrocephalus

- Enlarged ventricles
- Normal pressure
- Neurocognitive disorder, urinary incontinence, and gait apraxia
- Treatment includes shunt placement

Pseudodementia

- Typically seen in elderly patient who has a depressive disorder but appears to have symptoms of neurocognitive disorder; should improve after being treated with antidepressants
- Can usually date the onset of their symptoms

Table I-9-2. Pseudodementia versus Neurocognitive Disorder

Pseudodementia	Neurocognitive Disorder
Acute onset	Insidious onset
Family aware	Family unaware at first
Answers "I don't know" when asked questions	Confabulates when asked questions
Will talk about deficits when asked	Will minimize deficits
Treat with antidepressants	Will not improve with antidepressants

Table I-9-3. Delirium Versus Neurocognitive Disorder

Delirium	Neurocognitive Disorder
Acute onset	Insidious onset
Fluctuating course	Chronic course
Lasts days to weeks	Lasts months to years
Recent memory problems	Recent then remote memory problems
Disrupted sleep-wake cycle	Less disorientation at first
Disorientation	Normal sleep-wake cycle
Hallucinations common	Hallucinations, sundowning
Treat underlying condition	Supportive treatment

AMNESTIC DISORDERS

Definition. Characterized by prominent memory impairment in the absence of disturbances in level of alertness or the other cognitive problems that are present with delirium or neurocognitive disorder.

Risk Factors/Etiology (General Medical Conditions). Amnestic disorder is commonly associated with bilateral damage to diencephalic and mediotemporal structures (e.g., mammillary bodies, fornix, hippocampus). It may also be caused by conditions such as thiamine deficiency associated with alcohol dependence, head trauma, cerebrovascular disease, hypoxia, local infection (e.g., herpes encephalitis), ablative surgical procedures, and seizures.

Risk Factors/Etiology (Substances). Alcohol is likely the most common cause.

Subtypes:

Table I-9-4. Wernicke Versus Korsakoff Syndromes

	Wernicke	Korsakoff
Course	Acute	Chronic
Reversibility	Yes	No
Presentation	Ataxia, nystagmus, and ophthalmoplegia	Confusion, psychosis, anterograde and retrograde amnesia
Treatment	Thiamine	Thiamine

Physical Examination. Evidence of chronic alcohol abuse is often present.

Treatment. Correction of the underlying pathophysiology (e.g., administration of thiamine in alcohol-induced amnestic disorder) may be effective in reversing or slowing the progression of symptoms.

Differential Diagnosis. Delirium, neurocognitive disorder, and dissociative amnesia are the common rule-outs.

Review Question

A 65-year-old woman is found by the police in a filthy apartment after they were called by neighbors complaining of an unpleasant odor. Police find spoiled food in the kitchen, clogged sinks and toilets, and a severe infestation of cockroaches. The woman angrily refuses to leave with the police, stating that her neighbors have threatened her with attack and she fears that they will rob her apartment in her absence. Emergency room assessment reveals a very frail and unkempt woman who is completely alert and attentive. She believes it is 10 years earlier than it actually is, and she seems confused about her current finances and social contacts. She is unable to give the current addresses or phone numbers of her children and cannot find her phone book or purse. Physical exam is WNL.

Which of the following disturbances is the most likely diagnosis?

(A) Vascular neurocognitive disorder
(B) Wernicke's
(C) Pseudodementia
(D) Delirium
(E) Neurocognitive disorder of the Alzheimer's type

Answer: E. The woman presents with evidence of memory disturbance and severe problems managing her activities. This presentation is most consistent with neurocognitive disorder, which is characterized by memory impairment and other cognitive deficits. Delirium is characterized by problems with arousal and attention in addition to cognitive disturbances. Wernicke's is a less likely diagnosis because no cognitive disturbances other than memory impairment are present in this patient. Pseudodementia occurs quickly and patients are aware of the symptoms. Vascular neurocognitive disorder will have social deficits on physical exam.

9 Dissociative Disorders

Dissociation is the fragmentation or separation of aspects of consciousness, including memory, identity, and perception. Some degree of dissociation is always present; however, if an individual's consciousness becomes too fragmented, it may pathologically interfere with the sense of self and ability to adapt. Presenting complaints and findings of dissociative disorders include amnesia, personality change, erratic behavior, odd inner experiences (e.g., flashbacks, déjà vu), and confusion.

DISSOCIATIVE AMNESIA

Definition. Significant episodes in which the individual is unable to recall important and often emotionally charged memories

Risk Factors/Etiology. Psychological stress. More common in women and younger adults. Onset is usually detected retrospectively by the discovery of memory gaps of extremely variable duration.

Symptoms. Amnesia that may be general or selective for certain events.

Course. The amnesia may suddenly or gradually remit, particularly when the traumatic circumstance resolves, or may become chronic.

Associated Problems. Mood disorders, conversion disorder, and personality disorders are commonly present.

Treatment. Diagnostic evaluation for general medical conditions (e.g., head trauma, seizures, cerebrovascular disease) or substances (e.g., anxiolytic and hypnotic medications, alcohol) that may cause amnesia. Hypnosis, suggestion, and relaxation techniques are helpful. The patient should be removed from stressful situations when possible. Psychotherapy should be directed at resolving underlying emotional stress.

Differential Diagnosis. Major rule-outs are amnestic disorder due to a general medical condition, substance-induced amnestic disorder, and other dissociative disorders.

DISSOCIATIVE IDENTITY DISORDER

Definition. Formerly called multiple personality disorder. Presence of multiple, distinct personalities that recurrently control the individual's behavior, accompanied by failure to recall important personal information.

Risk Factors/Etiology. Childhood sexual abuse has been postulated as a risk factor.

Prevalence. More common in women

Onset. Usually occult; clinical presentation is several years later when disturbances in interpersonal functioning are present.

Key Symptoms. Presence of distinct personalities is often subtle; in some cases, it is discovered only during treatment for associated symptoms.

Associated Problems. Chaotic interpersonal relationships, impulsivity and self-destructive behavior, suicide attempts, substance abuse

Comorbidity. Borderline personality disorder, PTSD, major depressive disorder and other mood disorders, substance-related disorders, sexual disorders, and eating disorders.

Course. Symptoms may fluctuate or be continuous.

Differential Diagnoses. Borderline personality disorder and other personality disorders, bipolar disorder with rapid cycling, factitious disorder, and malingering

Treatment. Psychotherapy to uncover psychologically traumatic memories and to resolve the associated emotional conflict

DEPERSONALIZATION AND DEREALIZATION DISORDER

Definition. Persistent or recurrent feeling of being detached from one's mental processes or body, accompanied by intact sense of reality

Risk Factors/Etiology. Psychologic stress

Prevalence. Episodes of depersonalization are common.

Onset. Usually in adolescence or early adulthood. Stressful events may precede the onset of the disorder.

Key Symptoms

- *Depersonalization:* Often described as an "out-of-body experience"
- *Derealization:* Perception of the environment is often distorted or strange during episodes of depersonalization, accompanied by a feeling of being detached from physical surroundings. *Jamais vu* (a sense of familiar things being strange), déjà vu (a sense of unfamiliar things being familiar), and other forms of perceptual distortion may occur.

Associated Symptoms. Are often during episodes

Treatment. Psychotherapy directed at decreasing anxiety

Differential Diagnosis. Major rule-outs are substance-induced mental disorders with dissociative symptoms, including intoxication, withdrawal, hallucinogen-induced persisting perceptual disorder, panic disorder, and PTSD.

Review Question

A 19-year-old man is brought to the emergency room by volunteers from a homeless shelter. The man claims that he cannot remember who he is. He says that he found himself in Los Angeles but that he cannot remember where he comes from, the circumstances of his trip, or any other information about his life. He has neither identification nor money, but he has a bus ticket from New York.

Which of the following is the most likely diagnosis?

(A) Depersonalization disorder
(B) Dissociative amnesia
(C) Dissociative fugue
(D) Dissociative identity disorder
(E) Substance-induced amnestic disorder

Answer: C. The symptoms of amnesia, unexplained travel, and identity confusion are most suggestive of dissociative fugue. Because of the generalized nature of his amnesia, substance-induced amnestic disorder an unlikely diagnosis. There is insufficient evidence of distinct alternative personalities to diagnose dissociative identity disorder.

Adjustment Disorders 10

Definition. Maladaptive reactions to an identifiable psychosocial stressor

Risk Factors/Etiology. Cause: environmental stressors having an effect on functioning. Risk that a stressor will cause an adjustment disorder depends on an individual's emotional strength and coping skills.

Prevalence. Extremely common; all age groups

Onset. Within 3 months of the initial presence of the stressor.

Course. Lasts 6 months or less once the stressor is resolved. Can become chronic if stressor continues and new ways of coping with the stressor are not developed.

Key Symptoms. Complaints of overwhelming anxiety, depression, or emotional turmoil associated with specific stressors

Associated Problems. Social and occupational performance deteriorate, erratic or withdrawn behavior.

Treatment

- Remove or ameliorate the stressor.
- Brief psychotherapy to improve coping skills
- Pharmacotherapy: Anxiolytic or antidepressant medications are used to ameliorate symptoms if therapy is not effective.

Differential Diagnosis. Normal reaction to stress. Disorders that occur following stress (e.g., GAD, PTSD, major depressive disorder).

Types.

- Depressed mood
- Anxiety
- Mixed anxiety and depressed mood
- Disturbance of conduct
- Mixed disturbance of emotions and conduct

Review Question

A 28-year-old woman without previous behavioral problems becomes angry and bitter after her husband of 5 years leaves her to live with his female business partner. One week later, the woman quits her job without giving notice and begins drinking heavily. For the next several weeks, the woman telephones friends and tearfully expresses suicidal rumination. She also makes several threatening calls to her husband's new girlfriend.

Which of the following is the most likely diagnosis?

(A) Adjustment disorder
(B) Alcohol-induced mood disorder
(C) Bipolar I disorder
(D) Bipolar II disorder
(E) Borderline personality disorder

Answer: A. Depression and erratic behavior after an interpersonal stressor are most suggestive of adjustment disorder with mixed disturbance of emotions and conduct. The cause of the symptoms is most likely the stressor and not the physiologic result of alcohol. Bipolar disorders I and II are unlikely diagnoses for an individual who has no history of mood episodes. Borderline personality disorder is a less likely diagnosis for an individual who has no history of past behavioral and interpersonal difficulties.

Substance-Related Disorders 11

Definitions:

- Intoxication: maladaptive use of a substance that leads to changes (behavioral or physiological)
- Withdrawal: typically occurs after stopping or reducing a substance once tolerance has been established.
- Abuse: maladaptive pattern of use where the individual typically gets in trouble, does dangerous things, and keeps using despite consequences.
- Dependance: begins with tolerance of a substance followed by withdrawal signs and symptoms if patient tries to stop; the use of substances will affect patient's home life, work, and social life but use continues despite adverse consequences.

Physical and Psychiatric Examination

- **Substance abuse history:** Includes the substance(s) used, dosage(s), effects, duration and social context of use, and prior experiences with substance detoxification, rehabilitation, and relapse prevention
- **Medical history:** Includes complications of substance abuse
- **Psychiatric history:** Includes other primary psychiatric diagnoses and past treatments
- **Mental status examination:** Includes signs of substance-induced disorders
- **Physical examination:** Includes signs of substance use

Risk Factors/Etiology

- **Family history:** Sons of alcoholics are more likely to develop alcoholism than is the general population.
- **Physiology:** Individuals who are innately more tolerant to alcohol may be more likely to develop alcohol abuse.
- **Developmental history:** Poor parenting, childhood physical or sexual abuse, and permissive attitudes toward drug use.
- **Environmental risk factors:** Exposure to drug use through peers or certain occupations, economic disadvantage, and social isolation.
- **Psychiatric disturbances:** Conduct disorder, ADHD, depression, and low self-esteem.
- **Self-medication hypotheses:** Individuals with certain psychologic problems may abuse substances in an effort to alleviate symptoms (e.g., a person suffering from an anxiety disorder uses alcohol to decrease innate anxiety).

Diagnostic Tests

CAGE. Affirmative answers to any 2 of the following questions (or to the last question alone) are suggestive of alcohol abuse:

- Have you ever felt that you should cut down your drinking?
- Have you ever felt annoyed by others who have criticized your drinking?
- Have you ever felt guilty about your drinking?
- Have you ever had a morning drink (eye-opener) to steady your nerves or alleviate a hangover?

Urine drug screen: typically tests for amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, methodone, methaqualone, opiates, phencyclidine

Hair testing: typically tests for cocaine, amphetamines, methamphetamines, opiates, PCP, marijuana

Breath: typically tests for alcohol

Blood: increased AST, ALT, and GGT for alcohol abuse

Types of treatment.

- **Pharmacotherapy:** medications that work on the reward center, such as naltrexone, varenicline, and bupropion.
- **Psychotherapy:** preferably group therapy such as Alcoholics Anonymous, Narcotics Anonymous
- **Behavioral modification** techniques: disulfiram (aversive conditioning), patch, gum, inhaler (fading)
- **Detoxification units:** typically 5-10 days, provide medications to assure safe withdrawal from substances
- **Rehabilitation programs:** typically 28-day programs, learn about relapse prevention and identification of triggers

Table I-12-1. Blood Alcohol Levels and Effects on Behavior

Blood Alcohol Level	Behavioral Effect
0.05%	Thought, judgment, and restraint are loosened and disrupted
0.1%	Motor actions become clumsy
0.2%	• Motor area of the brain is depressed • Emotional behavior is affected
0.3%	Confused or stuporous
0.4–0.5%	• Coma • At higher levels, death may occur due to respiratory depression

Table I-12-2. Substances of Abuse

Substance	Signs and Symptoms of Intoxication	Treatment of Intoxication	Signs and Symptoms of Withdrawal	Treatment of Withdrawal
Alcohol	Talkativeness, sullenness, gregariousness, moodiness, etc.	Mechanical ventilation, if severe	Tremors, hallucinations, seizures, delirium tremens	Benzodiazepines Thiamine Multivitamin Folic acid
Amphetamines, cocaine	Euphoria, hypervigilance, autonomic hyperactivity, weight loss, papillary dilatation, perceptual disturbances	Short-term use of antipsychotics, benzodiazepines, vitamin C to promote excretion in urine, anti-hypertensives	Anxiety, tremulousness, headache, increased appetite, depression, risk of suicide	Antidepressants
Anabolic steroids	Irritability, aggression, mood changes, psychosis, heart problems, liver problems, etc.	Symptomatic, abstinence	Depression, risk of suicide	SSRIs
Bath salts	Headache, palpitations, hallucinations, paranoia, violence, increased heart rate and blood pressure	Supportive, benzodiazepines	Unknown	Unknown
Benzodiazepines	Inappropriate sexual or aggressive behavior, impairment in memory or concentration	Flumazenil	Autonomic hyperactivity, tremors, insomnia, seizures, anxiety	Benzodiazepines
Cannabis	Impaired motor coordination, slowed sense of time, social withdrawal, conjunctival injection, increased appetite, dry mouth, tachycardia	None	None	None
Ecstasy	Euphoria, mild psychedelia, hyponatremia, seizures, death, rhabdomyolisis, increased heart rate, blood pressure, and temperature	Cyproheptadine, benzodiazepines, dantrolene	Unknown	Unknown

(*Continued*)

Table I-12-2. Substances of Abuse (*Cont'd*)

Substance	Signs and Symptoms of Intoxication	Treatment of Intoxication	Signs and Symptoms of Withdrawal	Treatment of Withdrawal
Hallucinogens	Ideas of reference, perceptual disturbances, impaired judgment, dissociative symptoms, pupillary dilatation, tremors, incoordination	Supportive counseling (talking down), antipsychotics, benzodiazepines	None	None
Inhalants	Belligerence, apathy, assaultiveness, impaired judgment, blurred vision, stupor or coma	Antipsychotics if delirious or agitated	None	None
Opiates	Apathy, dysphoria, papillary constriction, drowsiness, slurred speech, impairment in memory, coma or death	Naloxone	Fever, chills, lacrimation, runny nose, abdominal cramps, muscle spasms, insomnia, yawning	Clonidine, methadone
Phencyclidine (PCP)	Belligerence, assaultiveness, psychomotor agitation, nystagmus, hypertension, seizures, coma, hyperacusis	Talking down, benzodiazepines, antipsychotics	None	None

Review Question

A 29-year-old man is brought in by judicial order for evaluation of his continued involvement with heroin use. The man denies that he is addicted but is willing to enter treatment to avoid more severe criminal penalties.

Which of the following is essential to determine the presence of heroin dependence in this individual?

(A) A family history of substance abuse
(B) Numerous arrests for dealing heroin
(C) He vehemently denies that his use of heroin causes him any problems
(D) He spends all his time trying to obtain heroin and can't stop himself from using it
(E) He is cooperative with treatment planning

Answer: D. Substance dependence is characterized by the presence of a constellation of symptoms that suggest compulsive substance use, monopolization of time by substance-related activities, social and occupational consequences, and physiologic changes including tolerance and withdrawal. A family history of substance abuse, arrests for drug dealing, denial of substance-related problems, and cooperation with treatment may all occur in individuals with substance dependence, but none are diagnostic when occurring by themselves.

Impulse Control Disorders 12

In impulse control disorders, patients are unable to resist an impulse. Before the act they have increased anxiety and after the act they feel pleasure (i.e., a reduction in anxiety). These disorders are ego-syntonic. Usually mediated by the serotonergic system.

INTERMITTENT EXPLOSIVE DISORDER

> The police recently arrested a 24-year-old psychiatric inpatient after he beat up another patient, causing severe injury to the other patient's head and neck area and requiring more than 100 stitches. When asked why he assaulted the other patient, the man replied, "He took my potato chips."

Definition. A disorder characterized by discrete episodes of failure to resist aggressive impulses that result in serious assaultive acts or destruction of property. The degree of the aggressive act is typically out of proportion to the stressor. The attacks may occur within minutes or hours and tend to resolve spontaneously.

Risk Factors/Epidemiology. Affects men more than women, especially men in prisons and women in psychiatric facilities. May have genetic linkage because it is seen frequently among first-degree relatives. Patients may have had a history of head trauma, seizures, encephalitis, hyperactivity, or other brain dysfunctions. May be linked to low levels of 5HIAA, abnormalities in the limbic system, or testosterone. The symptoms lessen as the patients age.

Physical and Psychiatric Presenting Symptoms

- Neurologic examination may reveal soft signs, such as right–left ambivalence
- EEG usually normal
- Psychologic tests often normal
- Poor work histories
- Marital difficulties
- Problems with the law

Treatment. Pharmacotherapy consisting of anticonvulsants, antipsychotics, beta-blockers, or SSRIs has been somewhat helpful. Psychotherapy, although not the preferred treatment, may be beneficial. When psychotherapy is used, it must be with pharmacotherapy and in a group setting.

Differential Diagnosis

- *Medical:* Epilepsy, brain tumors, degenerative disease, and endocrine disorders
- *Psychiatric:* Antisocial personality disorder, borderline personality disorder, schizophrenia, and substance intoxication

KLEPTOMANIA

A 25-year-old woman has a history of more than 20 arrests for stealing small items. She comes from a wealthy family and her parents do not understand her behavior. At home she has numerous salt and pepper shakers, napkin rings, ashtrays, etc.

Definition. A disorder characterized by the recurrent failure to resist impulses to steal objects that the patient does not need. There is increased anxiety prior to the act, followed by release of anxiety after the act. The act of stealing is the goal.

Risk Factors/Epidemiology. Appears to be more common in women. Symptoms may be linked to stress in the patient's life. Often associated with mood disorders, OCDs, and eating disorders, such as bulimia nervosa. It has been linked to brain disease and mental retardation.

Physical and Psychiatric Presenting Symptoms. May have signs of anxiety and depression. Feel guilty or ashamed of their actions.

Treatment. Insight-oriented therapy may be indicated to help the patients understand their behavior. Behavioral therapy, including aversive conditioning and systematic desensitization, has been helpful in some patients. If pharmacotherapy is indicated, consider SSRIs or anticonvulsants.

Differential Diagnosis

- *Medical:* None
- *Psychiatric:* Antisocial personality disorder, malingering, mania, and schizophrenia

PYROMANIA

A 19-year-old mentally retarded boy is arrested after he is found setting the neighbor's garbage cans on fire. Neighbors had observed him in the past starting fires in his own backyard, staring at them for hours, watching them burn.

Definition. A disorder characterized by deliberate fire-setting on more than one occasion. There is anxiety before the act and a release of anxiety after the act, sometimes followed by fascination and gratification. Must rule out arson.

Risk Factors/Epidemiology. Seen more frequently in men who are mildly retarded and may have a history of alcohol abuse. Many have histories of truancy and cruelty to animals.

Physical and Psychiatric Presenting Symptoms. Many watch fires in their neighborhoods and/or set off fire alarms. Lack remorse for the consequences of their actions, and show resentment toward authority figures. May become sexually aroused by the fire.

Treatment. Because no treatment has been proven to be beneficial, incarceration may be indicated.

Differential Diagnosis

- *Medical:* Brain dysfunctions
- *Psychiatric:* Antisocial personality disorder, conduct disorder, mania, and schizophrenia

PATHOLOGIC GAMBLING

Mike, a 40-year-old married man and father of two, was fired from his job because of embezzlement of company funds. He disappeared with the company payroll cash. When found, he did not have the money on him and admitted to losing it while gambling. His wife left him two months ago, and he has not seen his wife or children since then.

Definition. A disorder characterized by persistent and recurrent gambling behavior that includes a preoccupation with gambling, a need to gamble with more money, attempts to stop gambling and/or to win back losses, illegal acts to finance the gambling, or loss of relationships due to gambling.

Risk Factors/Epidemiology. More common in men, and seen in their parents as well. Increased incidence of alcohol dependence. May be predisposed by death, loss of a loved one, poor parenting, exposure to gambling behavior, and/or divorce. May be linked to mood disorders, OCDs, panic disorder, agoraphobia, and ADHD.

Physical and Psychiatric Presenting Symptoms

- May engage in antisocial behavior to obtain money for gambling
- Appear overconfident
- Suicide attempts
- Multiple arrests and/or incarceration

Treatment. Gamblers anonymous (GA) is the most effective treatment. It involves public confessions, peer pressure, and sponsors. Although pharmacotherapy is usually not indicated, some studies have shown some efficacy with SSRIs.

Differential Diagnosis

- *Medical:* None
- *Psychiatric:* Mania, antisocial personality disorder

TRICHOTILLOMANIA

Mary, a 20-year-old woman, is rushed to the hospital after she complains of severe abdominal pain. She appears thin and withdrawn and is missing a lot of hair from both her scalp and eyebrows. A physical examination reveals an intestinal obstruction.

Definition. A disorder characterized by pulling one's own hair, resulting in hair loss. There is anxiety before the act and a release of anxiety after the act.

Risk Factors/Epidemiology. Affects women more than men. Associated disorders include OCD, obsessive-compulsive personality disorder, and depressive disorders.

Physical and Psychiatric Presenting Symptoms

- Hair loss is significant over all areas of the body.
- Area most affected is the scalp.

- May eat the hair, resulting in bezoars, obstruction, and malnutrition
- Head-banging, nail-biting, and gnawing may be present.
- Examination of the scalp reveals short, broken hairs along with long hairs.

Treatment. Treatment usually consists of behavior-modification techniques to decrease patient's anxiety; as well as pharmacotherapy, such as SSRIs, anticonvulsants, or antipsychotics to help decrease the urges.

Differential Diagnosis

- *Medical:* Alopecia areata, tinea capitis (biopsy would be indicated)
- *Psychiatric:* OCD, factitious disorder

Review Question

A 22-year-old woman was recently seen at her college graduation hoarding food in her purse and briefcase. When asked why, she replied, "I might be hungry later." She appeared to be of average height and weight, but with poor dentition. She has numerous calluses on both hands and fingers. Which of the following impulse disorders is she at risk for developing?

(A) Trichotillomania
(B) Kleptomania
(C) Pathologic gambling
(D) Pyromania
(E) Intermittent explosive disorder

Answer: B. Patients with bulimia nervosa have an increased incidence of kleptomania. These patients will steal things they do not need.

13 Eating Disorders

ANOREXIA NERVOSA

Definition. Characterized by failure to maintain a normal body weight, fear and preoccupation with gaining weight and unrealistic self-evaluation as overweight. Subtypes are restricting (no binge-eating or purging) and binge-eating/purging (regularly engaged in binge-eating/purging).

Risk Factors/Etiology. Biologic factors are suggested by higher concordance for illness in monozygotic twins and the fact that amenorrhea may precede abnormal eating behavior. Psychologic risk factors include emotional conflicts concerning family control and sexuality. A cultural risk factor may be an emphasis on thinness.

Prevalence. 0.5%. Occurs at a 1:10 male-to-female ratio.

Onset. Average age is 17 years. Very late–onset anorexia nervosa has a poorer prognosis. Onset is often associated with emotional stressors, particularly conflicts with parents about independence, and sexual conflicts.

Key Symptoms

- Restricted food intake and maintaining diets of low-calorie foods. Weight loss may also be achieved through purging (i.e., vomiting or taking laxatives, diuretics, or enemas) and exercise.
- Great concern with appearance. Significant amount of time spent examining and denigrating self for perceived signs of excess weight.
- Denial of emaciated conditions
- With binge-eating/purging: Self-induced vomiting; laxative and diuretic abuse

Associated Symptoms. Excessive interest in food-related activities (other than eating), obsessive-compulsive symptoms, depressive symptoms.

Course. Some individuals recover after a single episode, and others develop a waxing-and-waning course.

Outcome. Long-term mortality rate of individuals hospitalized for anorexia nervosa is 10%, resulting from the effects of starvation and purging or suicide.

Physical Examination. Signs of malnutrition include emaciation, hypotension, bradycardia, lanugo (i.e., fine hair on the trunk), and peripheral edema. Signs of purging include eroded dental enamel caused by emesis and scarred or scratched hands from self-gagging to induce emesis. There may be evidence of general medical conditions caused by abnormal diets, starvation, and purging.

Diagnostic Tests

- **Signs of malnutrition:** normochromic, normocytic anemia, elevated liver enzymes, abnormal electrolytes, low estrogen and testosterone levels, sinus bradycardia, reduced brain mass, and abnormal EEG
- **Signs of purging:** metabolic alkalosis, hypochloremia, and hypokalemia caused by emesis; metabolic acidosis caused by laxative abuse

Treatment. Initial treatment should be correction of significant physiologic consequences of starvation with hospitalization if necessary. Behavioral therapy should be initiated, with rewards or punishments based on absolute weight, not on eating behaviors. Family therapy designed to reduce conflicts about control by parents is often helpful. Antidepressants may play a limited role in treatment when comorbid depression is present.

Differential Diagnosis. Major rule-outs are bulimia nervosa, general medical conditions that cause weight loss, major depressive disorder, schizophrenia, OCD, and body dysmorphic disorder.

BULIMIA NERVOSA

Definition. Characterized by frequent binge-eating and purging and a self-image that is unduly influenced by weight. Types:

- **Purging:** self-induced vomiting or the use of laxatives, diuretics, or enemas
- **Nonpurging:** fasting or exercise, but no purging during bulimic episodes

Risk Factors/Etiology. Psychologic conflict regarding guilt, helplessness, self-control, and body image may predispose. Biologic factors are suggested by frequent association with mood disorders.

Prevalence. 2% in young adult females. Occurs at a 1:9 male-to-female ratio

Onset. Usually during late adolescence or early adulthood and often follows a period of dieting

Course. May be chronic or intermittent

Outcome. 70% of cases have remitted after 10 years. Co-occurring substance abuse is associated with a poorer prognosis

Key Symptoms

- **Recurrent episodes of binge-eating.** Obsession with dieting but followed by binge-eating of high-calorie foods. Binges are associated with emotional stress and followed by feelings of guilt, self-recrimination, and compensatory behaviors.
- **Recurrent, inappropriate compensatory behavior.** After a binge, attempts to prevent weight gain through self-induced vomiting, misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
- **Self-evaluation is unduly influenced by body shape and weight.** Self-castigation for mild weight gain or binges. Attempts to conceal binge-eating or purging, or lies about behaviors.

Associated Problems. Depressive symptoms, substance abuse, and impulsivity (e.g., kleptomania)

Comorbid Disorders. Borderline personality disorder present in about 50%

Physical Examination. Evidence of purging

Diagnostic Tests. Evidence of laxative or diuretic abuse

Treatment. Cognitive and behavioral therapy are major treatment. Psychodynamic psychotherapies are useful for accompanying borderline personality traits. Antidepressant medications, particularly SSRIs, are usually employed.

Differential Diagnosis. Major rule-outs are anorexia nervosa, binge-eating/purging, major depressive disorder with atypical features, and borderline personality disorder.

Review Question

A 19-year-old woman is hospitalized for dehydration caused by severe, laxative-induced diarrhea. She is depressed about the recent breakup of a romantic relationship. She admits that she uses laxatives because she has been binge-eating frequently and is worried about gaining weight. Although the woman is very thin, she believes that she is overweight. She has never had a menses.

Which of the following is the most likely diagnosis?

(A) Anorexia nervosa
(B) Brief psychotic disorder
(C) Bulimia nervosa
(D) Delusional disorder, somatic type
(E) Major depressive disorder

Answer: A. The patient presents with low body weight, a distorted body image, a fear of obesity, and amenorrhea, all of which strongly suggest anorexia nervosa. Bingeing and purging behavior is commonly present with this disorder. Because this individual has the essential features of anorexia nervosa, the diagnosis of bulimia nervosa is not made. Because the woman shows no evidence of delusions, brief psychotic disorder or delusional disorder are unlikely diagnoses. Although depression commonly accompanies eating disorders, it does not appear to be the primary problem in this woman's case.

Used with permission from Williams & Wilkins, *Board Review Series: Psychiatry*, 1997.

Personality Disorders 14

Definition. Characterized by personality patterns that are pervasive, inflexible, and maladaptive. There are 3 clusters:

Cluster A: Peculiar thought processes, inappropriate affect

Cluster B: Mood lability, dissociative symptoms, preoccupation with rejection

Cluster C: Anxiety, preoccupation with criticism or rigidity

Risk Factors/Etiology. Personality disorders (PDs) are the product of the interaction of inborn temperament and subsequent developmental environment. Risk factors include innate temperamental difficulties, such as irritability; adverse environmental events, such as child neglect or abuse; and personality disorders in parents.

Prevalence. All are relatively common. More males have antisocial and narcissistic PDs, more females have borderline and histrionic PDs.

Onset. Usually not diagnosed until late adolescence or early adulthood

Course. Usually very chronic over decades without treatment. Symptoms of paranoid, schizoid, and narcissistic PD often worsen with age; symptoms of antisocial and borderline PD often ameliorate.

Key Symptoms. Long pattern of difficult interpersonal relationships, problems adapting to stress, failure to achieve goals, chronic unhappiness, low self-esteem

Associated Diagnoses. Mood disorders

Treatment. Psychotherapy is the mainstay of treatment. Intensive and long-term psychodynamic and cognitive therapy are treatments of choice for most PDs. Use of mood stabilizers and antidepressants is sometimes useful for Cluster B PDs.

Differential Diagnosis. Major rule-outs are mood disorders, personality change due to a general medical condition, and adjustment disorders.

SPECIFIC PERSONALITY DISORDERS

Cluster A

Paranoid PD: Distrust and suspiciousness. Individuals are mistrustful and suspicious of the motivations and actions of others and are often secretive and isolated. They are emotionally cold and odd.

A 57-year-old man living in a condominium complex constantly accuses his neighbors of plotting to avoid payment of their share of maintenance. He writes angry letters to other owners and has initiated several lawsuits. He lives alone and does not socialize.

Schizoid PD: Detachment and restricted emotionality. Individuals are emotionally distant. They are disinterested in others and indifferent to praise or criticism. Associated features include social drifting and dysphoria.

A 24-year-old man lives alone and works nights as a security guard. He ignores invitations from coworkers to socialize and has no outside interests.

Schizotypal PD: Discomfort with social relationships; thought distortion; eccentricity. Individuals are socially isolated and uncomfortable with others. Unlike Schizoid PD, they have peculiar patterns of thinking, including ideas of reference and persecution, odd preoccupations, and odd speech and affect.

A 30-year-old man is completely preoccupied with the study and the brewing of herbal teas. He associates many peculiar powers with such infusions and says that plants bring him extra luck. He spends all of his time alone, often taking solitary walks in the wilderness for days at a time, collecting plants for teas. He has no history of disorganized behavior. At times he believes that songs on the radio are about his life.

Cluster B

Histrionic PD. Usually characterized by colorful, exaggerated behavior and excitable, shallow expression of emotions; uses physical appearance to draw attention to self; sexually seductive; and is uncomfortable in situations where he or she is not the center of attention.

A 30-year-old woman presents to the doctor's office dressed in a sexually seductive manner and insists that the doctor comment on her appearance. When the doctor refuses to do so, she becomes upset.

Borderline PD. Usually characterized by an unstable affect, mood swings, marked impulsivity, unstable relationships, recurrent suicidal behaviors, chronic feelings of emptiness or boredom, identity disturbance, and inappropriate anger. If stressed, may become psychotic. Main defense mechanism is splitting.

A 20-year-old nurse was recently admitted after reporting auditory hallucinations, which have occurred during the last few days. She reports marriage difficulties and believes her husband is to blame for the problem. She has several scars on her wrists and has a history of substance abuse.

Antisocial PD. Usually characterized by continuous antisocial or criminal acts, inability to conform to social rules, impulsivity, disregard for the rights of others, aggressiveness, lack of remorse, and deceitfulness. These have occurred since the age of 15, and the individual is at least 18 years of age.

> A 22-year-old man was recently arrested after he set his mother's house on fire. He has had numerous problems with the law, which started at an early age when he was sent to a juvenile detention center for his behavior at both home and school. He lacks remorse for setting the fire and expresses a desire that his mother would have died in the fire.

Narcissistic PD. Usually characterized by a sense of self-importance, grandiosity, and preoccupation with fantasies of success. This person believes s/he is special, requires excessive admiration, reacts with rage when criticized, lacks empathy, is envious of others, and is interpersonally exploitative.

> A famous actor is outraged when a director questions his acting abilities during rehearsal for a play. The actor responds by walking off the stage and not returning to the stage unless the director apologizes publicly for her behavior.

Cluster C

Avoidant PD. Individuals have social inhibition, feelings of inadequacy, and hypersensitivity to criticism. They shy away from work or social relationships because of fears of rejection that are based on feelings of inadequacy. They feel lonely and substandard and are preoccupied with rejection.

> A 43-year-old man dreads an upcoming company holiday party because he believes that he is incapable of engaging in social conversation or dancing. He believes that he will become an object of pity or ridicule if he attempts such things. He anticipates yet another lonely holiday.

Dependent PD: Submissive and clinging behavior related to a need to be taken care of. Individuals are consumed with the need to be taken care of. They have clinging behavior and worry unrealistically about abandonment. They feel inadequate and helpless and avoid disagreements with others. They usually focus dependency on a family member or spouse and desperately seek a substitute should this person become unavailable. Associated features include self-doubt, excessive humility, poor independent functioning, mood disorders, anxiety disorders, adjustment disorder, and other PDs.

> A 26-year-old man is brought into the emergency room after sustaining severe rectal lacerations during a sadistic sexual episode with his partner. The patient is extremely concerned that the police not be informed because he doesn't want to upset his partner and cause the partner to leave.

Obsessive-Compulsive PD. Individuals are preoccupied with orderliness, perfectionism, and control. They are often consumed by the details of everything and lose their sense of overall goals. They are strict and perfectionistic, overconscientious, and inflexible. They may be obsessed with work and productivity and are hesitant to delegate tasks to others. Other traits include being miserly and unable to give up possessions. This PD should not be confused with OCD, a separate disorder. Associated features include indecisiveness, dysphoria, anger, social inhibition, and difficult interpersonal relationships.

> A 37-year-old woman seeks psychotherapy as a result of an impending divorce. She says that her demands that the house be kept spotless, that extremely detailed and fixed work and recreational schedules be maintained, and that rigid dietary habits be observed have driven her spouse away.

Normal Sleep and Sleep Disorders 15

NORMAL SLEEP

Sleep Stages

Sleep is divided into 2 stages, nonrapid eye movement (NREM) and rapid eye movement (REM). There are numerous differences between them.

NREM. A state of sleep characterized by slowing of the EEG rhythms, high muscle tone, absence of eye movements, and thoughtlike mental activity. In this state the brain is inactive while the body is active. NREM is made up of 4 stages:

Table I-15-1. NREM

Stage	EEG Findings	Distribution
Stage 1	Disappearance of alpha wave and appearance of theta wave	5%
Stage 2	k complexes and sleep spindles	45%
Stage 3	Appearance of delta wave	12%
Stage 4	Continuation of delta wave	13%

REM (Rapid Eye Movement). A stage of sleep characterized by aroused EEG patterns, sexual arousal, saccadic eye movements, generalized muscular atony (except middle-ear and eye muscles), and dreams. In this state, the brain is active and the body is inactive.

Table I-15-2. REM

Stage	EEG Findings	Distribution
REM	Bursts of sawtooth waves	25%

Sleep Facts

Table I-15-3. Sleep Facts (Stage 2–REM)

Stage	Fact(s)
Stage 2	Longest of all the sleep stages
Stages 3 and 4	Also called slow wave or delta sleep Hardest to arouse Tends to vanish in the elderly
REM	Easiest to arouse Lengthens in time as night progresses Increased during the second half of the night

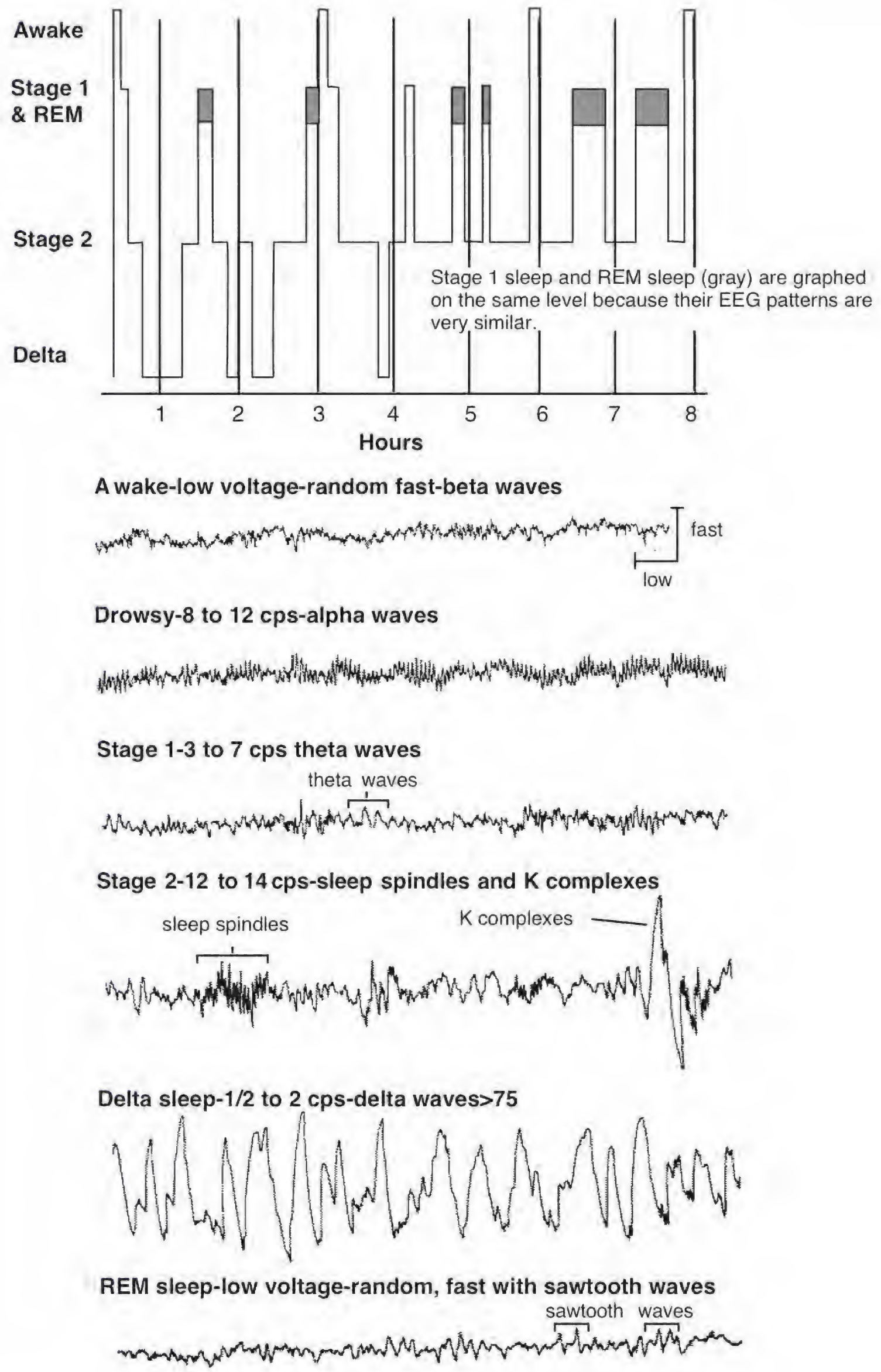


Figure I-15-1. Sleep Architecture Diagram Showing Stages of Sleep in Sequence

Sleep Latency. The time needed before you actually fall asleep. Typically less than 15 minutes in most individuals; however, may be abnormal in many disorders, such as insomnia, etc.

REM Latency. The period lasting from the moment you fall asleep to the first REM period. Lasts approximately 90 minutes in most individuals. However, several disorders will shorten REM latency; these disorders include depression and narcolepsy.

Characteristics of Sleep from Infancy to Old Age

- Total sleep time decreases.
- REM percentage decreases.
- Stages 3 and 4 tend to vanish.

Neurotransmitters of Sleep

- **Serotonin:** Increased during sleep; initiates sleep
- **Acetylcholine:** Increased during sleep; linked to REM sleep
- **Norepinephrine:** Decreased during sleep; linked to REM sleep
- **Dopamine:** Increased toward end of sleep; linked to arousal and wakefulness

Chemical Effects on Sleep

- **Tryptophan:** Increases total sleep time
- **Dopamine agonists:** Produce arousal
- **Dopamine antagonists:** Decrease arousal, thus produce sleep
- **Benzodiazepines:** Suppress Stage 4 and, when used chronically, increase sleep latency
- **Alcohol intoxication:** Suppresses REM
- **Barbiturate intoxication:** Suppresses REM
- **Alcohol withdrawal:** REM rebound
- **Barbiturate withdrawal:** REM rebound
- **Major depression:** Shortened REM latency, increased REM time, suppression of delta, multiple awakenings, and early morning awakening

SLEEP DISORDERS

Narcolepsy

A 35-year-old man was recently hospitalized for the tenth time after he crashed his car into a post. When questioned, he did not remember the cause of the accident and had just had his license suspended. His friends reported occasions when he fell asleep during dinner and during conversations with them.

Definition. A disorder characterized by excessive daytime sleepiness and abnormalities of REM sleep for a period of greater than 3 months. REM sleep occurs in less than 10 minutes. Patients feel refreshed upon awakening.

Physical and Psychiatric Presenting Symptoms

- **Sleep attacks:** Most common symptom
- **Cataplexy:** Pathognomonic sign, consisting of a sudden loss of muscle tone which may have been precipitated by a loud noise or intense emotion. If short episode, the patient remains awake.
- **Hypnagogic and hypnopompic hallucinations:** Hallucinations that occur as the patient is going to sleep and is waking up from sleep, respectively.
- **Sleep paralysis:** Most often occurs during awakening, when the patient is awake but unable to move.
- Report falling asleep quickly at night

Treatment. Forced naps at a regular time of day is usually the treatment of choice. When medications are given, psychostimulants are preferred. If cataplexy is present, antidepressants such as TCAs are preferred. Gamma-hydroxybutyrate (GHB) is also used for narcolepsy–cataplexy by improving the quality of nighttime sleep.

Sleep Apnea

An overweight man reports having difficulties in his marriage because of his snoring at night. During the day, he reports feeling tired.

Definition. A disorder characterized by the cessation of airflow at the nose or mouth during sleep. These apneic episodes usually last longer than 10 seconds each. Characterized by a loud snore followed by a heavy pause. Considered pathologic if the patient has more than 5 episodes an hour or more than 30 episodes during the night. In severe cases, patients may experience more than 300 apneic episodes during the night.

Physical and Psychiatric Presenting Symptoms

- Usually seen in obese, middle-aged males
- Sometimes associated with depression, mood changes, and daytime sleepiness
- Spouses typically complain of partner's snoring, and of partner's restlessness during the night
- Complain of dry mouth in the morning
- May have headaches in the morning
- Complain of being tired during the day
- May develop arrhythmias, hypoxemia, pulmonary hypertension, and sudden death

Types of Sleep Apnea

- *Obstructive:* Muscle atonia in oropharynx; nasal, tongue, or tonsil obstruction
- *Central:* Lack of respiratory effort
- *Mixed:* Central at first, but prolonged due to collapse of the airway

Treatment. Continuous positive nasal airway pressure is the treatment of choice. Other treatment includes weight loss, surgery. Sleeping on one's side instead of one's back will help keep the airways open.

Insomnia

> While studying for an important exam, Michael, a third-year medical student, has been unable to sleep for the past several days. At night, he lies awake and imagines himself doing poorly on the exam and failing medical school. During the day, he is tired and frequently falls asleep during his classes.

Definition. A disorder characterized by difficulties in initiating or maintaining sleep.

Risk Factors/Epidemiology. Typically associated with some form of anxiety or anticipatory anxiety. Many patients have underlying psychiatric disorders, such as depression, etc. If due to a psychiatric disorder, seen more frequently in women. Other conditions include PTSD, OCD, and eating disorders.

Physical and Psychiatric Presenting Symptoms

- Predominant complaint is difficulty initiating or maintaining sleep
- Affects the patient's level of functioning
- Frequent yawning and tiredness during the day

Treatment. Consider good sleep hygiene techniques, such as arising at same time of the day, avoiding daytime naps, avoiding evening stimulation, discontinuing CNS-acting drugs, taking hot baths near bedtime, eating meals at regular times, using relaxation techniques and maintaining comfortable sleeping conditions. If these do not work, consider behavioral modification techniques such as stimulus control. If medications are to be used, consider zolpidem, eszopiclone, or zaleplon.

Differential Diagnosis

- *Medical:* Pain, CNS lesions, endocrine diseases, aging, brain-stem lesions, alcohol, diet, medications
- *Psychiatric:* Anxiety, tension, depression, and environmental changes, other sleep disorders

Parasomnias

Table I-15-4. Parasomnias

Disorder	Sleep Stage	Characteristics	Treatment
Nightmares (dream anxiety disorder)	REM	Memory of the event upon awakening Increases during times of stress Reported by 50% of the population	Usually none indicated, but may use REM suppressants such as TCAs
Night terror (sleep terror disorder)	Stages 3 and 4	Awakened by scream or intense anxiety No memory of the event the following day Seen more frequently in children More common in boys Runs in families	Treatment rarely required If medication is needed, consider benzodiazepines
Sleeptalking	All stages of sleep	Common in children Usually involves a few words May accompany night terrors and sleepwalking	No treatment is necessary
Sleepwalking	Stage 3 and 4	Sequence of behaviors without full consciousness May perform perseverative behaviors Usually terminates in awakening followed by confusion May return to sleep without any memory of the event Begins at a young age More common in boys May find neurologic condition Sleep deprivation may exacerbate	Need to assure patient safety Use drugs to suppress Stages 3 and 4, such as benzodiazepines

Review Questions

1. An overweight man of average height presents to his doctor's office complaining of feeling tired during the day. He has missed several days of work due to this problem. Which of the following is the most likely diagnosis?

   (A) Narcolepsy
   (B) Insomnia
   (C) Sleep apnea
   (D) Normal sleep pattern
   (E) Hypersomnia

2. Which of the following is the most likely explanation for a young man suddenly falling down but not losing consciousness?

   (A) Syncope
   (B) Cataplexy
   (C) Sleep paralysis
   (D) Medication toxicity
   (E) Hypotensive episode

3. Which of the following is the treatment of choice for insomnia?

   (A) Long-term use of benzodiazepines
   (B) Behavioral techniques
   (C) Drinking coffee before bedtime
   (D) Regular exercises before bedtime
   (E) Frequent naps during the day

1. **Answer: C.** Patients with sleep apnea have multiple episodes of waking up in the middle of the night. Therefore, they are tired during the day. These patients are typically unaware that they wake in the middle of the night.

2. **Answer: B.** Cataplexy is the sudden loss of muscle tone without loss of consciousness. It is differentiated from syncope in that syncope typically includes loss of consciousness. Patients with narcolepsy are usually young and do not have any blood pressure abnormalities.

3. **Answer: B.** Although benzodiazepines are regularly used for the treatment of insomnia, the best treatment includes behavioral techniques such as stimulus control. The patient leaves the bed whenever he is unable to fall asleep, therefore conditioning himself that the bed is only used for sleeping. Choices C, D, and E will tend to cause insomnia.

Human Sexuality 16

Sexual Identity. Based on the person's sexual characteristics, such as external and internal genitalia, hormonal characteristics, and secondary sexual characteristics

Gender Identity. Based on the person's sense of maleness or femaleness, established by age 3

Gender Role. Based on the external behavioral patterns that reflect the person's inner sense of gender identity

Sexual Orientation. Based on the person's choice of a love object; may be heterosexual (opposite sex), homosexual (same sex), bisexual (both sexes), or asexual (no sex)

MASTURBATION

- Normal precursor of object-related sexual behavior
- All men and women masturbate.
- Genital self-stimulation begins at age 15 to 19 months, no sexual fantasies present
- As puberty arrives, sexual interest peaks and masturbation increases.
- Males learn to masturbate earlier than females and tend to do it more often.
- Adolescents will have sexual fantasies while masturbating.
- Commonly seen among adolescents, married couples, and the elderly
- Excessive only if it interferes with daily functioning

HOMOSEXUALITY

- Removed from the DSM in 1980 as a mental illness
- Considered a variant of human sexuality, not a pathologic disorder
- Most homosexuals report feelings toward same sex individuals since adolescence.
- Freud believed it was an arrest of psychosexual development.
- Recent studies indicate it may be due to genetic and biologic causes.
- Greater incidence among monozygotic versus dizygotic twins
- No difference in the sexual practices from those exhibited by heterosexuals.
- Male–male relationships may be less stable than female–female relationships.
- Equal incidence of mental illness when compared with heterosexuals.
- Exceptions (normal during adolescence):
  - Visual comparison of genitalia
  - Mutual masturbation
  - Group exhibitionism
  - Handholding, kissing, etc.

SEXUAL DYSFUNCTIONS

A group of disorders related to a particular phase of the sexual response cycle. These disorders can be psychologic, biologic, or both, and include, desire, arousal, orgasm, and pain.

Table I-16-1. Sexual Dysfunctions

Phase	Characteristics	Disorder	Treatment
Desire	Focuses on the patient's drives, motivation, and desires	**Hypoactive sexual desire:** patients have a decrease or absence of sexual fantasies, desires, etc. **Sexual aversion:** a complete aversion to all sexual contact	Individual psychotherapy to address issues with patient, such as feelings of guilt, poor self-esteem, homosexual impulses, etc. Couples therapy may be indicated if due to marital conflict.
Arousal	Consists of a sense of sexual pleasure with accompanying physiologic changes	**Female sexual arousal:** persistent failure to achieve or maintain adequate lubrication during the sexual act **Impotence:** Persistent or recurrent inability to attain or maintain adequate erection until completion of the sexual act	Individual psychotherapy to help deal with issues of guilt, anxiety, and fear. Evaluate for use of medications that cause vaginal dryness, such as antihistamines or anticholinergics. Couples therapy if due to marital conflict. Must rule out if organic versus psychological. Consider plethysmography or postage stamp test. Couples therapy if due to marital conflict.
Orgasm	Physiologic state in which sexual tension is released and contractions are produced in various organs.	**Female orgasmic:** recurrent or persistent inability to achieve an orgasm either through masturbation or sexual intercourse **Premature ejaculation:** Ejaculation before the man wishes to do so, before penetration, or just after penetration	Individual psychotherapy to help deal with issues of guilt, fear of impregnation, etc. Treatment includes use of vibrators, education, and fantasy. Couples therapy if due to marital conflict. Consider behavioral techniques such as squeeze and stop-and-go. Individual psychotherapy to help deal with issues of anxiety about the sexual act. Couples therapy if due to marital conflict. If pharmacotherapy is indicated, consider the use of SSRIs.
Pain	Subjective sense of pain associated with the sexual act. Most likely due to dynamic factors.	**Genito-pelvic pain disorder:** Pain associated with sexual intercourse in either male or female. Not diagnosed when organic cause has been found or if due to lack of vaginal lubrication. **Penetration disorder:** Involuntary constriction of the outer one-third of the vagina that interferes with the sexual act	Individual psychotherapy to help the woman deal with issues of anxiety and tension about the sexual act. Couples therapy if due to marital conflict. Behavioral techniques, such as the use of dilators. Couples therapy if due to marital conflict. Individual psychotherapy to help deal with issues of fear of impregnation, strict upbringing, religion, etc.

PARAPHILIC DISORDER

A 20-year-old man was caught outside his neighbor's window, looking in as she disrobed. Before his arrest, he would wander the subway stations and rub himself up against women as well as expose himself to women who were nearby. All of these activities produced great pleasure in the patient.

Definition. A group of disorders that is recurrent and sexually arousing. Usually focus on humiliation and/or suffering and the use of nonliving objects and involve nonconsenting partners. Typically occur for >6 months and are usually distressing and cause impairment in patient's level of functioning.

Risk Factors/ Epidemiology. Affects men more than women. Peak incidence is age 15–25. Tend to have other paraphilias, and as the patient ages, the frequency decreases.

Physical and Psychiatric Presenting Symptoms

- Sexual activity is ritualistic.
- Fantasy is typically fixed and shows very little variation.
- Intense urge to carry out the fantasy

Treatment. Individual psychotherapy is indicated to help the patient understand the reasons why the paraphilia developed. Patient also becomes aware of daily activities and how they are related to the paraphilic behavior. Behavioral techniques, such as aversive conditioning, may be indicated in some situations. Pharmacotherapy consists of antiandrogens or SSRIs to help reduce patient's sexual drive.

Differential Diagnosis. Must distinguish between experimentation and actual paraphilias.

Types of Paraphilic Disorders

- **Exhibitionism:** recurrent urge to expose oneself to strangers
- **Fetishism:** involves the use of nonliving objects usually associated with the human body
- **Frotteurism:** recurrent urge or behavior involving touching or rubbing against a nonconsenting partner
- **Pedophilia:** recurrent urges or arousal toward prepubescent children. Most common paraphilia.
- **Voyeurism:** recurrent urges or behaviors involving the act of observing an unsuspecting person who is engaging in sexual activity, disrobing, etc. Earliest paraphilia to develop.
- **Masochism:** recurrent urge or behavior involving the act of humiliation
- **Sadism:** recurrent urge or behavior involving acts in which physical or psychologic suffering of a victim is exciting to the patient.
- **Transvestic fetishism:** recurrent urge or behavior involving cross-dressing. Usually found in heterosexual men.

GENDER DYSPHORIA

> Billy, a 5-year-old boy, was found in his parent's bedroom wearing his mother's clothes. He has been observed going to the bathroom to urinate while sitting on the toilet as well as playing with dolls instead of his trucks and guns. He prefers to wear dresses and hates being a boy.

Definition. Also called gender identity dysphoria. A disorder characterized by a persistent discomfort and sense of inappropriateness regarding the patient's assigned sex.

Risk Factors/Epidemiology. Seen more frequently in men than in women. Cause is unknown. Many believe it may be due to biologic reasons, such as hormones, etc.

Physical and Psychiatric Presenting Symptoms

- Children will have preference for friends of the opposite sex.
- Preoccupied with wearing opposite gender's clothes
- Refuse to urinate sitting down, if a girl, or standing up, if a boy
- Believe they were born with the wrong body
- Routinely request medications or surgery to change their physical appearance
- Women may bind their breasts, have mastectomies, take testosterone to deepen the voice.
- Men may have electrolysis to remove body hair and take estrogens to change the voice, and may have surgeries to remove the penis and create a vagina.

Review Questions

1. What is the treatment of choice for premature ejaculation?
   (A) Plethysmography
   (B) Dilators
   (C) Squeeze technique
   (D) Postage stamp
   (E) Aversive conditioning

2. What is the most common cause of erectile dysfunction due to a medical condition?
   (A) Alcohol
   (B) Diabetes
   (C) Cirrhosis
   (D) Myocardial infarction
   (E) Propanolol

1. **Answer: C.** The treatment of premature ejaculation typically consists of behavioral techniques aimed at prolonging the time before ejaculation occurs. These include the squeeze-and-go technique. Choices A and D are for the diagnosis of impotence. Choice B is for the treatment of vaginismus.
2. **Answer: B.** Diabetes has been known to be a common cause of impotence. Alcohol has been proven to be a common cause of periodic impotence in middle-aged men.

Psychopharmacology 17

GENERAL PRINCIPLES OF ANTIPSYCHOTIC MEDICATION

Used to treat manifestations of psychosis and other psychiatric disorders.

Precise mechanism of antipsychotic action is unknown; however, antipsychotic medication (APM) blocks several populations of dopamine (D2, D4) receptors in the brain.

The newer antipsychotic medications also block some serotonin receptors (5HT), a property that may be associated with increased efficacy.

Antipsychotic medication also variably blocks central and peripheral cholinergic, histaminic, and alpha-adrenergic receptors.

Types of antipsychotic medications

- Typical: work mostly on dopamine receptors, treat the positive symptoms (hallucinations and delusions) and have many side effects (haloperidol, fluphenazine, chlorpromazine, etc.)
- Atypical: work mostly on dopamine and serotonin receptors, treat both positive and negative symptoms (flat affect, poor grooming, social withdrawal, anhedonia, etc), and have fewer side effects; always used as first-line agents (risperidone, olanzapine, etc.)

SIDE EFFECTS OF ANTIPSYCHOTIC MEDICATION

General

Sedation. Due to antihistaminic activity

Hypotension. Effect is due to alpha-adrenergic blockade and is most common with low-potency APMs.

Anticholinergic Symptoms. Dry mouth, blurred vision, urinary hesitancy, constipation, bradycardia, confusion, and delirium

Endocrine Effects. Gynecomastia, galactorrhea, and amenorrhea

Dermal and Ocular Syndromes. Photosensitivity, abnormal pigmentation, cataracts

Other Effects. Cardiac conduction abnormalities (especially with thioridazine), agranulocytosis with clozapine

Movement

Acute Dystonia. (Dystonic Reaction).

- Presentation: Spasms of various muscle groups
- Can be dramatic and frightening to patient
- Can be a major contributing factor to subsequent noncompliance with treatment
- Young men may be at higher risk, seen in 10% patients.
- Treatment: anticholinergics, such as benztropine, diphenhydramine, or trihexyphenidyl
- Can occur within hours after treatment

Akathisia

- Presenting Symptoms: Motor restlessness, "ants in your pants"
- Differential Diagnosis: Often mistaken for anxiety and agitation
- Treatment: lowering the dose, adding benzodiazepines or beta-blockers, switching to other antipsychotic medication
- Can occur several weeks after treatment

Tardive Dyskinesia (TD).

- Characterized by choreoathetosis and other involuntary movements
- Movements often occur first in the tongue or fingers and later involve the trunk.
- Etiology may be a form of "chemical denervation hypersensitivity," which is caused by chronic dopamine blockade in the basal ganglia.
- Patients who take high doses of older antipsychotic medication for long periods of time are at highest risk, and movements gradually worsen with continued use.
- Treatment: Use newer antipsychotic medications.
- Seen more frequently in elderly females
- Can occur after 3–6 months after treatment

Adverse Effects: Neuroleptic Malignant Syndrome

- Presentation: Fairly rare and potentially life-threatening condition characterized by muscular rigidity, hyperthermia, autonomic instability, and delirium. CPK will be elevated.
- Usually associated with high dosages of high-potency antipsychotic medication.
- Treatment: Immediate discontinuation of the medication and physiologic supportive measures; dantrolene or bromocriptine may be used.

ATYPICAL ANTIPSYCHOTIC MEDICATIONS

- Clozapine: gold standard for the treatment of schizophrenia; not used as first-line agent; may cause agranulocytosis (<1%) so monitoring of WBC is essential
- Risperidone: increased risk of movement disorders and elevation of prolactin
- Olanzapine: increased risk of weight gain, metabolic syndrome, diabetes, etc.
- Quetiapine: lowest risk of movement disorders
- Paliperidone: active metabolite of risperidone; fewer side effects than risperidone

- Ziprasidone: prolongation of Qt interval
- Aripiprazole: partial dopamine agonist at low doses, may be used as adjunct for depression
- Asenapine: sedation, akathisia
- Iloperidone: hypotension, dizziness, somnolence
- Lurasidone: somnolence, akathisia, weight gain

How to treat psychotic symptoms:

- First-line: always use atypical agents
- Emergency room: use short-acting intramuscular agent such as haloperidol, fluphenazine, olanzapine, or ziprasidone
- Non-adherant patient: use long-acting antipsychotic medication such as haloperidol, fluphenazine, risperidone, paliperidone, or olanzapine
- Last resort: clozapine
- All meds ineffective: may consider ECT

ANTIDEPRESSANT MEDICATIONS (ADs)

Clinical Guidelines

- Overall efficacy for treatment of major depressive disorder is around 70%.
- Newer ADs should be considered first because of better safety profile.
- Difficult to predict which patient will respond to which antidepressant, so trials of several antidepressants may be necessary before an effective one is found.
- Individual antidepressants differ greatly in their side-effect profiles and must be matched to patient preference and ability to tolerate.
- Older antidepressants are extremely dangerous when an overdose is ingested. When used to treat individuals with depressive symptoms, clinicians should generally prescribe in small quantities and only after determining the absence of suicidal intent.
- If no response to treatment after 4 weeks, or if patient cannot tolerate current antidepressant, switch to another.
- Treatment should continue for 6 months to 1 yr after favorable response.

Untoward Effects

- **Sedation:** due to histamine blockade
- **Hypotension:** due to alpha blockade
- **Anticholinergic effects:** dry mouth, blurry vision, urinary retention, confusion
- **Cardiac:** conduction abnormalities most marked with TCAs
- **Seizures:** bupropion (Wellbutrin)
- **Sexual dysfunction:** anorgasmia and decreased libido with SSRIs; priapism with trazodone (Desyrel)

SSRIs

Inhibit reuptake of serotonin

- **Types:** Fluoxetine (Prozac), paroxetine (Paxil), and sertraline (Zoloft), fluvoxamine. (Luvox), citalopram (Celexa), escitalopram (Lexapro)
- Reduced number of serious side effects
- Simple dosing schedules
- Significant incidence of agitation, nausea, vomiting, headache, diarrhea, and sexual dysfunction

Hybrid antidepressants (not real name)

- Venlafaxine: inhibit reuptake of NE and S, used for depression and anxiety, may cause hypertension, blurry vision, diaphoresis, etc.
- Desvenlafaxine: inhibit reuptake of NE and S, active metabolite of venlafaxine therefore fewer side effects
- Duloxetine: inhibit reuptake of NE and S, approved for depression and neuropathic pain
- Bupropion: inhibits reuptake of NE and dopamine, approved for depression and smoking cessation; may cause seizures so avoid using in patients with eating disorders, alcohol withdrawal seizures, or seizure disorders
- Trazodone: S agonist and reuptake inhibitor, approved for depression and insomnia; may cause priapism (prolonged and painful erection)
- Mirtazapine: classified as tetracyclic antidepressant, approved for depression and insomnia; weight gain is main side effect

TCAs

- Inhibit reuptake of NE, S, and dopamine
- Include nortriptyline, amitriptyline, imipramine desipramine, clomipramine, etc.
- Adverse effects: (especially tertiary TCAs) significant sedation, orthostatic hypotension, and anticholinergic effects. They are the most dangerous antidepressants in overdose.

MAOIs

- Inhibit MAO-A and/or MAO-B in the CNS and have antidepressant efficacy
- Differ by the type of inhibition (i.e., reversible or irreversible), the severity of adverse effects, and the specificity of inhibition (MAO-A or -B)
- Include phenelzine, tranylcypromine, and isocarboxazid
- **Selegiline:** selective inhibitor of MAO-B; currently approved only for treatment of Parkinson's disease
- **Indications:** Second-line treatment for major depressive disorder, depressive disorders with atypical features, and some anxiety disorders.
- **Hypertensive crisis:** may occur with tyramine-rich foods or if certain other medications are ingested, including nasal decongestants, antiasthmatic medications, and amphetamines. Avoid red wine, aged cheese, and chocolate.
- **Adverse effects:** sedation, weight gain, orthostatic hypotension, liver toxicity (with hydrazine MAOIs), and sexual dysfunction.

ELECTROCONVULSIVE THERAPY (ECT)

Indications

- Major depressive episodes that have not responded to antidepressant medication or mood stabilizers
- Major depressive episodes with high risk for immediate suicide
- Major depressive episodes in patients with contraindications to using antidepressant medication
- Major depressive episodes in patients who have responded well to ECT in the past

Untoward effects and contraindications

- Transient memory disturbance: increases in severity over the course of ECT and then gradually resolves over several weeks
- Complications of associated anesthesia and induced paralysis
- Transiently increased intracranial pressure. Therefore, the presence of space-occupying intracranial lesions requires extreme caution.

MOOD-STABILIZING MEDICATIONS

Lithium

Indications

- Bipolar and schizoaffective disorders: First-line medication for treatment and prophylaxis of mood episodes
- Adjunctive treatment of major depressive disorder: May augment responsiveness to antidepressant medications in some patients

Untoward Effects

- Dose-related: Tremor, gastrointestinal (GI) distress, headache
- Dermatologic problems: acne; interferes with patient compliance
- Weight gain: may interfere with patient compliance
- Cardiac conduction: electrocardiogram (ECG) changes usually benign
- Hypothyroidism: 5% of patients develop thyroid problems
- Leukocytosis: usually occurs and seems to be benign
- Polyuria: diabetes insipidus is common and may be troublesome to patients
- Teratogenicity: associated with cardiac abnormalities; contraindicated in first trimester, Ebstein's anomaly (tricuspid valve)
- Nephrotoxic

Toxicity Management

- Keep plasma levels <1.5 mEq/L; optimal 1.0 mEq/L
- Dehydration and hyponatremia predispose to lithium toxicity by increasing serum lithium levels.
- Tremor at therapeutic levels may respond to decreased dosage.
- Lithium levels may increase with ACE inhibitors, NSAIDs, loop and thiazide diuretics

Divalproex

- Treatment of choice for rapid-cycling bipolar disorder, or when lithium is ineffective, impractical, or contraindicated.
- Increasingly popular in emergency settings, may give loading dose
- Time course of treatment response is similar to lithium.
- Efficacy for prophylaxis is unclear.
- Untoward effects: sedation, cognitive impairment, tremor, GI distress, hepatotoxicity, weight gain, possible teratogenicity (spina bifida), and alopecia.

Carbamazepine

- Second-line choice for treatment of bipolar disorder when lithium and divalproex are ineffective or contraindicated
- Rare but serious hematologic and hepatic side effects and significant sedation make carbamazepine less useful.
- May cause agranulocytosis

Lamotrigine

- Approved for bipolar depression
- May cause Steven-Johnson syndrome

ANXIOLYTIC MEDICATIONS

Types

- Benzodiazepines: facilitate transmission of GABA
- Buspirone: S receptor partial agonist

Benzodiazepines

Clinical Guidelines

- Avoid abrupt changes in benzodiazepine dosage.
- Use lower dosages for the elderly.
- Do not mix with alcohol or other sedative-hypnotic medications.
- Consider dependency potential.
- May cause confusion, problems with memory, and falls (especially in the elderly)
- Abrupt discontinuation may cause seizures

Buspirone

- Effective in the treatment of generalized anxiety disorder and social phobia
- Lag time of about 1 week before clinical response
- No additive effect with sedative-hypnotics
- No withdrawal syndrome
- No sedation or cognitive impairment
- Headache may occur.

Suicide 18

SUICIDE

Presentations

- Recent suicide attempt
- Complaints of suicidal thoughts
- Admission of suicidal thoughts upon questioning
- Demonstration of possible suicidal behavior

Risk Factors for Suicidal Behavior

- History of suicide threats and attempts
- Perceived hopelessness (demoralization)
- Presence of psychiatric illness/drug abuse
- Males
- Elderly
- Social isolation
- Low job satisfaction
- Chronic physical illness

Emergency Assessment

- Detain until the emergency evaluation is completed
- Take all suicide threats seriously
- Question about suicide ideation, intent, and plan
- Get information from third parties
- Don't identify with the patient
- Emergency treatment decisions about suicidal behavior are based on clinical presentation and presence of risk factors

19 Psychotherapies

Table I-19-1. Psychotherapies

Type of Therapy	Goal	Selection Criteria	Duration	Techniques
Psychoanalysis	Resolution of neurosis	Psychologically minded	4–5× per week for years	Free association, defense analysis, interpretation of transference
Insight oriented	Focus on interpersonal goals	Intact reality testing, capacity for insight	1–3× per week for months to years	Defense analysis, interpretation of transference
Supportive	Support reality testing, provide ego support	Healthy patients in time of crises or very ill patients	Days to months to years	Problem solving, suggestion, reinforcement
Behavioral	Modify learned behavior patterns	Those with maladaptive behaviors or psychophysiologic disorders	Time limited	Relaxation techniques, aversive therapy, systematic desensitization, flooding, token economy
Group	Alleviation of symptoms, change relationships, alter family-couple dynamics	Groups target specific disorders, family and couples, personality disorders, etc.	1× per week for weeks to years	Group specific
Cognitive	Change distorted views of self, world, and others	Depressive disorders	1× per week for 15–25 weeks	Assigned readings, homework, behavioral techniques, identification of irrational beliefs and attitudes

Epidemiology & Ethics

Epidemiology 1

KEY DEFINITIONS

Epidemiology. Study of the distribution and determinants of health-related states within a population. It refers to the patterns of disease and the factors that influence those patterns.

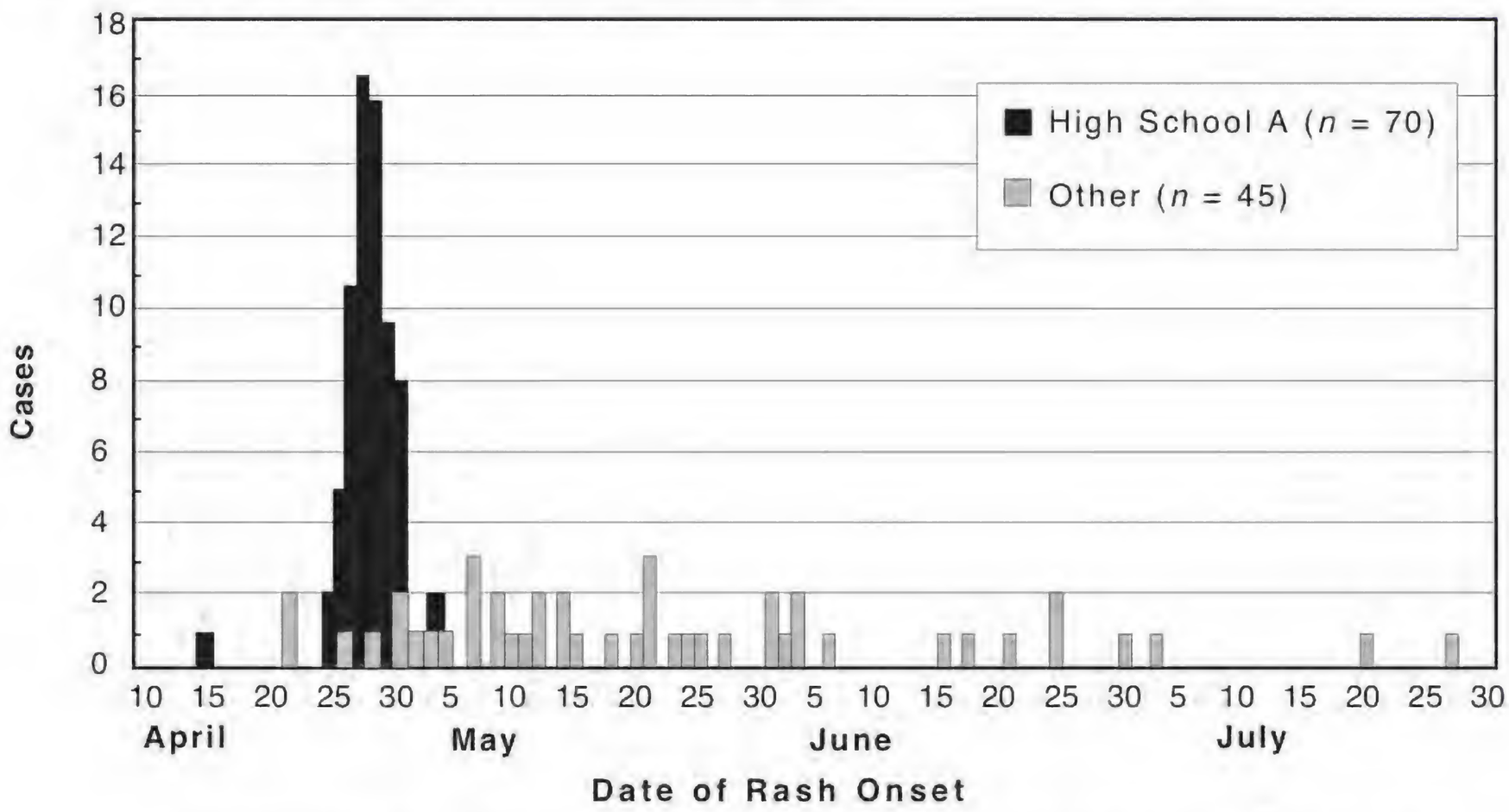
Clinical epidemiology. Study and application of population-based data with patient decision-making.

Endemic. The usual, expected rate of disease over time. The disease is maintained without much variation within a region.

Epidemic. Occurrence of disease in *excess* of the expected rate. Epidemiology is the "study of epidemics" (see Figures 1, 2, and 3). Usually presents in a larger geographic span than endemics.

Pandemic. A worldwide epidemic.

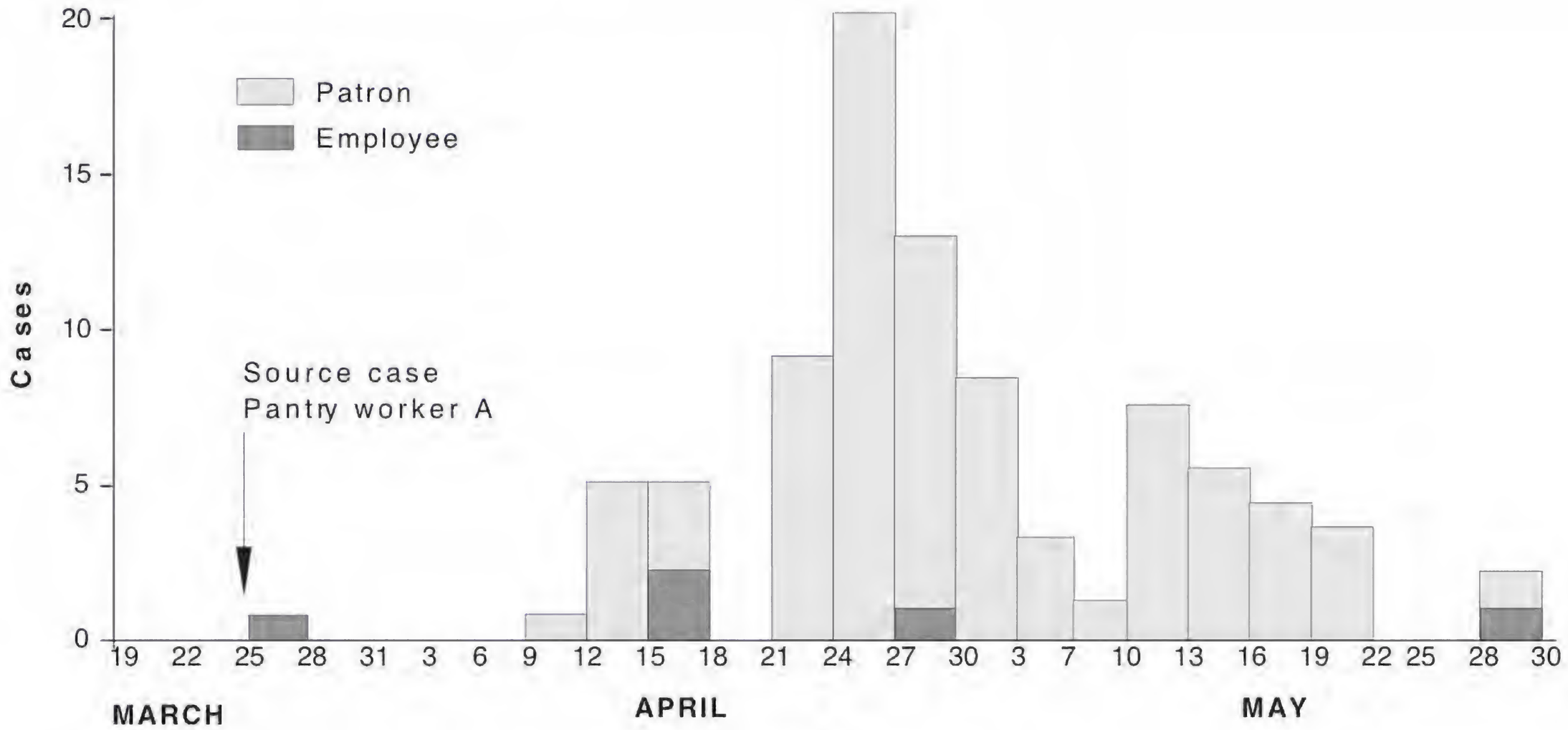
Epidemic curve. A visual description of an epidemic curve is disease cases plotted against time. The classic signature of an epidemic is *a "spike" in time.*



Reported measles cases by date of rash onset, Elgin, Illinois, April 15 to July 28, 1985

Figure II-1-1. Measles Outbreak

An explosive point-source outbreak of measles in an Elgin, Illinois school caused by a single index case whose hacking cough produced an aerosol of measles virus (see Figure 1-1).



Onsets of illness in patrons and employees: hepatitis A outbreak on a floating restaurant, Florida.

Figure II-1-2. Food-Borne Outbreak

A food-borne outbreak of hepatitis A among patrons of a Fort Lauderdale, Florida restaurant (*see* Figure 1-2).

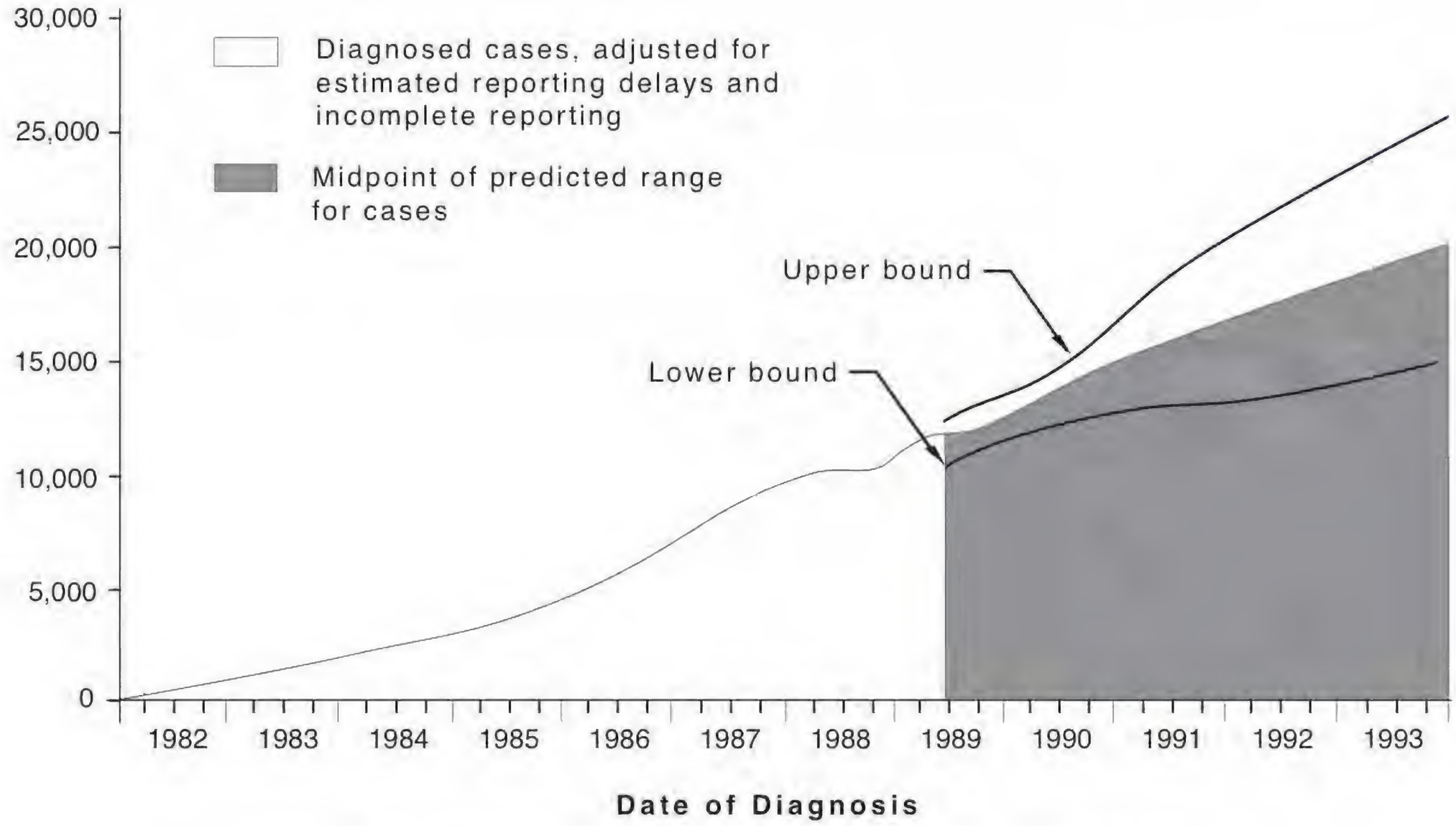


Figure II-1-3. Multiple-Year Increase in AIDS Cases in the United States

Continuous increase in U.S. AIDS cases from the original report of five cases in 1981 through the 500,000th case reported in 1995, and beyond (*see* Figure 1-3).

TYPES OF PREVENTION

Prevention goals in medicine promote health, preserve health, restore health when it is impaired, and minimize suffering and distress. These goals aim to minimize both morbidity and mortality.

Primary prevention is the promotion of health at both individual and community levels by facilitating health-enhancing behaviors, preventing the onset of risk behaviors, and diminishing exposure to environmental hazards. *Primary prevention efforts decrease disease incidence.*

Secondary prevention is the screening for risk factors and early detection of asymptomatic or mild disease, permitting timely and effective intervention and curative treatment. *Secondary prevention efforts decrease disease prevalence.*

Tertiary prevention is the reduction of long-term impairments and disabilities and prevention of repeated episodes of clinical illness. The goals of tertiary prevention are to prevent recurrence and to slow progression.

Table II-1-1. Examples of Prevention for Coronary Heart Disease

Primary prevention	Health education programs to promote healthy lifestyles and prevent onset of heart disease risk factors. An example would be the "Hearty Heart" nutrition program for elementary school children.
Secondary prevention	Community blood pressure screening. Physician support to quit smoking cigarettes.
Tertiary prevention	Graded aerobic physical activity program prescribed to patients during recovery from first myocardial infarction.

Review Questions

Prevention

Response options for Questions 1–4:

A. Health promotion
B. Primary prevention
C. Secondary prevention
D. Tertiary prevention
E. Palliative care

1. Breast self-examination.
2. Physical therapy/rehabilitation and ergonomic training program for blue-collar workers recovering from severe back strain injury sustained on the job.
3. School-based sexual health education program for middle school students.
4. Confidential PPD testing to detect latent tuberculosis infection conducted at community clinics by county health department personnel.

1. **Answer: C.** Self-screening for early detection leading to early diagnosis and effective, life-saving treatment.
2. **Answer: D.** Rehabilitation following an episode of injury with a concurrent focus on preventing subsequent injury.
3. **Answer: B.** Prevention of onset of risky sexual behaviors.
4. **Answer: C.** Screening to detect tuberculosis (TB) infection, to be followed by therapy to prevent progression to active TB.

Review Questions

Key Definitions

Response options for **Questions 5–7**:

A. Hypoendemic
B. Endemic
C. Epidemic
D. Hyperendemic
E. Pandemic
F. Holoendemic

5. A multinational outbreak of influenza
6. The rapid rise in AIDS cases among drug injectors in Bangkok in the late 1980s
7. The long-term, relatively constant rate of occurrence of colorectal cancer in U.S. women

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5. **Answer: E.** A pandemic is an epidemic that crosses national borders.
6. **Answer: C.** AIDS appeared suddenly, and the epidemic increased exponentially.
7. **Answer: B.** When disease cases are plotted over time, a flat horizontal line depicts an endemic pattern.

MEASURES OF MORBIDITY AND MORTALITY

Rates

Rate

- Rate is the frequency of occurrence of epidemiologic events in populations. They are used to compare epidemiologic events among populations.
- Rates allow direct comparisons of "events per identical number" of people in the two or more populations.
- Rates permit comparisons of epidemiologic events occurring in a single population assessed at several points in time.

Rate Equation

$$\text{Rate} = \frac{\text{Numerator}}{\text{Denominator}} \times \text{Multiplier}$$

where the *numerator* is the number of epidemiologic events, the *denominator* is the number of people in the population of interest, and the *multiplier* is selected so that the result of the rate computation generally yields a number in the range from 1 to 100.

Multipliers

For *major vital statistics*, such as *birth rate, death rate*, and *infant mortality rate*, the preferred multiplier is 1,000. The result is expressed as a "*rate per 1,000*."

For *individual diseases,* the most common multiplier is 100,000. The result is expressed as a "rate per *100,000*."

Matching Numerator and Denominator

- Essential rule: Match the numerator with the denominator.
- Match on person, place, and time characteristics.

$$\text{Rate} = \frac{\text{Epidemiologic events occuring in a population of persons at a given place at a given time}}{\text{Defined population of persons at a given place at a given time}} \times \text{Multiplier}$$

SPECIFIC AND ADJUSTED RATES

Specific Rates

Definition: Specific rates "specify" a subset of the total population that is singled out for special examination or comparison with other subsets of the population. Use the following formula:

$$\text{Specific rate} = \frac{\text{All events in specified subpopulation}}{\text{Specified subpopulation}} \times \text{Multiplier}$$

Common demographic variables used for specific rates:

- Age group
- Gender
- Race/ethnicity
- Highest level of education attained
- Marital status
- Socioeconomic status

(Populations can be stratified on two or more demographic variables at a time.)

Matching numerator and denominator is the most important concept for computing specific rates. Example:

"Event" of interest:	Cancer deaths
Place:	State of Nevada
Time:	Calendar year, 1996
Rate of interest:	Age-specific rate* for ages 45–64
Formula:	$\frac{\text{Deaths from cancer among persons ages 45–64 in Nevada during 1996}}{\text{Population of Nevada residents ages 45–64, midyear 1996}} \times 100{,}000$

*Age-specific rate: a rate for a specified age group

Adjusted Rates (or Standardized)

Definition: Rates calculated after using statistical procedures to minimize demographic differences between populations being compared. Comparisons of rates between two groups may be misleading if the composition of the groups differs on important demographic characteristics. Adjustment improves the validity of the comparison.

The following two cases are examples of comparisons between groups where rate adjustment is clearly essential.

> The rate of alcoholism and alcohol abuse is found to be higher among workers in an automobile assembly plant compared with same-age workers at a textile mill in the same city.

Adjustment for gender differences is warranted. *First, the two populations differ on a demographic characteristic:* Automotive workers tend to be men; textile workers tend to be women. *Second, the disease/disorder is related to the same demographic:* Alcohol problems are more prevalent in men. The higher observed rate in automotive workers may be due to the marked differences in gender in the two employee populations.

> The rate of lung cancer is found to be higher among male factory workers ages 50–64, than among male computer programmers ages 50–64, in the same company.

Adjustment for level of education is warranted. *First, the two populations differ on a demographic characteristic:* Factory workers tend to have a low level of education; computer programmers are likely to be college graduates. *Second, the disease/disorder is related to the same demographic:* The major cause of lung cancer is cigarette smoking. People with lower levels of education have higher smoking rates; college graduates have the lowest smoking rates. The differences in lung rates may reflect expected differences in smoking prevalence rates for workers with different levels of education.

Properties of a board-style adjusted rate problem:

- A significant difference in the rate of disease is declared to exist between two groups. The compared rates are unadjusted.
- The two groups differ on a key demographic variable.
- The disease is known to be related to the same demographic variable.
- *Adjustment will tend to make the observed difference between unadjusted rates disappear.*

Table II-1-2. Disease Rates Positively Correlated with Age

		Population A		Population B		Population C	
		Cases	Population	Cases	Population	Cases	Population
Younger	1/1,000	1	1,000	2	2,000	3	3,000
Intermediate	2/1,000	4	2,000	4	2,000	4	2,000
Older	3/1,000	9	3,000	6	2,000	3	1,000
		14	6,000	12	6,000	10	6,000
Crude Rates	Per/1,000	2.3		2.0		1.6	

Review Questions

Adjusted Rates

8. In the United States, the suicide rate for physicians is significantly higher than the corresponding rate for the general population. What is the most appropriate interpretation of this finding?

   A. Higher suicide rates in physicians are likely to be related to job stress, including life-and-death decision making for patients in the care of the physician.

   B. Higher rates of suicide in physicians are likely to be related to constant exposure to human suffering, trauma, and death.

   C. Physicians have higher rates of suicide than the general population; no further interpretation is possible from the information presented.

   D. While the unadjusted rate of suicide is higher for physicians, failure to adjust for differences between physicians and the general population on socioeconomic status precludes meaningful interpretation of this finding.

   E. The finding of statistical significance proves that physicians are at higher risk for suicide than nonphysicians.

8. **Answer: D.** When a significant relationship is stated but the comparison groups have some obvious demographic difference, look for the answer that suggests conclusions may be invalid unless rates are "adjusted" or "standardized" to compensate for the demographic disparities.

   In this instance, physicians are generally a higher socioeconomic status (SES) group relative to the general population. Suicide rates are elevated for high-SES people. Once adjusted for SES differences, the finding of higher suicide rates in physicians no longer stands.

   Note: Strongly suspect any response that claims that "proof" has been demonstrated. No single study can achieve proof. Furthermore, no investigator would be so self-aggrandizing as to claim to have conducted the definitive study. Such a response option ("distractor") is almost always wrong.

MEASURES OF MORBIDITY

Incidence and Prevalence

Prevalence Rate: All Cases

Prevalence rate is the proportion of individuals with existing disease at a point in time (point prevalence). It is the proportion of individuals with existing disease during a period of time (period prevalence).

- The focus is on chronic conditions.
- The numerator refers to ALL individuals who have the illness at the time(s) in question.

$$\text{Prevalence rate} = \frac{\text{Persons with existing disease at a given place at a given time}}{\text{Population of persons at risk for disease at a given place at a given time}} \times \text{Multiplier}$$

Incidence Rate: New Cases Only

- The incidence rate is the proportion of individuals developing new disease during a period of time.
- It is the rate of new disease events in a population during a period of time.
- Incidence rates can be calculated only over a period of time, not at a single point.
- The focus is on acute conditions.

$$\text{Incidence rate} = \frac{\text{Persons with disease onset at a given place at a given time}}{\text{Population of persons at risk to catch disease at a given place at a given time}} \times \text{Multiplier}$$

Attack rate is a type of incidence rate that focuses on a known exposure or risk. For example, if 10 of 100 children who attend daycare A, and 40 of 100 children who attend daycare B develop diarrhea, the attack rate would be 10% for attendance at daycare A and 40% for attendance at daycare B.

Note

Relationship between Incidence and Prevalence:

- Prevalence = Incidence × Duration (conceptual formula, not computational)
- $\text{Duration} = \frac{\text{Prevalence}}{\text{Incidence}}$
- Changes in incidence, duration, or both will ultimately affect prevalence.

"Prevalence Pot"

A "prevalence pot" is a common portrayal of the concept of prevalence and its relationship to incidence. At the first moment of observation, the count of cases "in the pot" provides an estimate of point prevalence. Incident cases are observed over time. These new cases are added to the pre-existing cases. As long as clinical illness persists, cases remain in the pot. Cases leave the prevalence pot in one of two ways, through recovery or death. *Changes in prevalence over time can be determined by monitoring trends in incidence, recovery, and death.*

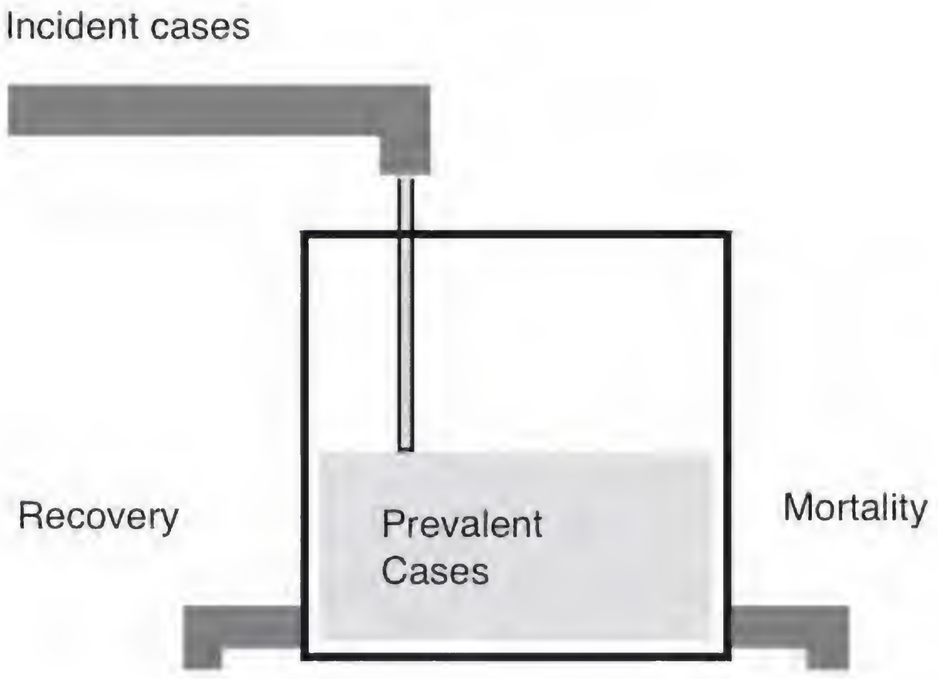


Figure II-1-4. Prevalence Pot Diagram

Number needed to treat (NNT): How many in general population need to be treated to prevent one case?

- The *inverse* of the incidence rate
- If incidence = 16 per 1,000 = 16/1,000
- Inverse = 1,000/16 = 625 = NNT

Table II-1-3. Equations for Common Epidemiological Measures

Measure	Equation	Notes
Incidence rate	$\frac{\text{New cases}}{\text{Total population at risk to catch disease during period of time}}$	– Acute cases – New cases only
Prevalence rate	$\frac{\text{Total cases}}{\text{Total population at risk during period of time*}}$	– Chronic cases – Do not include in numerator any deaths or cases that recovered from disease, as they are no longer existing cases of illness
Prevalence	Incidence × duration	– Assuming incidence and duration are stable
Duration	$\frac{\text{Prevalence}}{\text{Incidence}}$	
Numbers needed to treat	$\frac{1}{\text{Incidence rate}}$	– Inverse of incidence rate

*Point prevalence will have denominator at a specific point in time, whereas period prevalence will include a specific period of time.

Review Questions

Incidence and Prevalence

9. A pharmaceutical corporation completes trials on a vaccine for a severe strain of influenza virus demonstrating high vaccine efficacy. The Food and Drug Administration approves the vaccine for use in the U.S. As the influenza pandemic approaches U.S. borders, the Centers for Disease Control and Prevention launches a nationwide campaign to vaccinate the population using local public health department personnel throughout the country to ensure that the vaccine is available, free of charge, to all people. Assuming that a high degree of vaccine coverage is achieved, what is the expected impact of this major public health initiative?

   A. Decreased duration of influenza illness leading to decreased prevalence
   B. Decreased incidence of influenza illness leading to decreased prevalence
   C. Decreased incidence offset by increased duration: no change in prevalence
   D. No change in observed incidence or duration: no change in prevalence
   E. Effects on prevalence cannot be determined from the information provided

10. A new, effective treatment for a common disease, leading to complete cure, is developed. Which of the following impacts on disease occurrence is expected?

   A. Decreased duration of illness, leading to decreased prevalence
   B. Decreased incidence of illness, leading to decreased prevalence
   C. Decreased incidence and duration of illness, leading to decreased prevalence
   D. No change in observed incidence or duration: no change in prevalence
   E. Effects on prevalence cannot be determined from the information provided

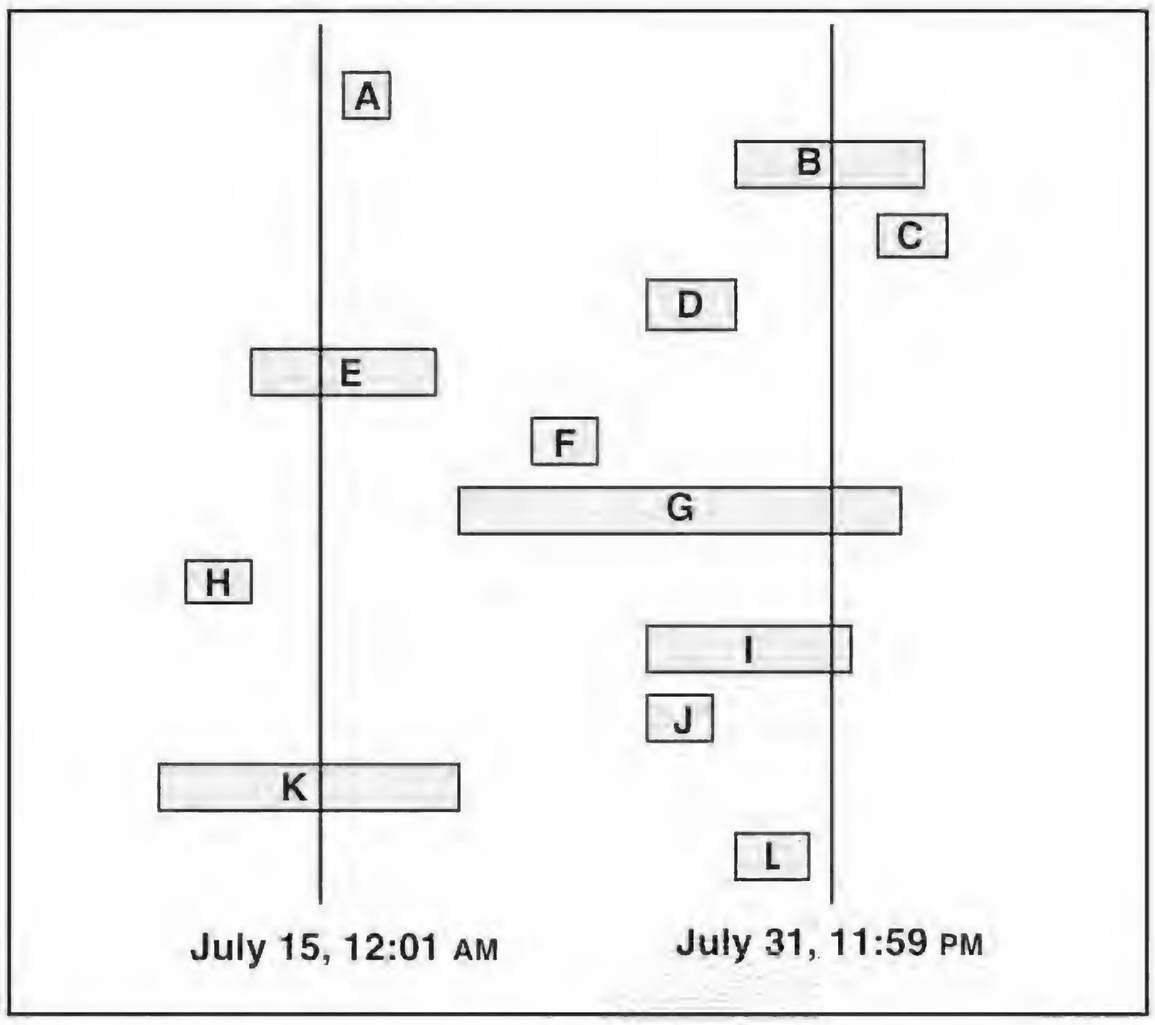
9. **Answer: B.** Vaccination decreases the likelihood of development of new infection and clinical disease. In turn, the prevalence during the peak of the influenza season will be decreased.

10. **Answer: A.** An effective treatment will move people more quickly toward recovery. Average duration of illness will decrease. Prevalence, the proportion of people ill with the disease at a point in time, will also decrease. This will apply to both acute and chronic diseases. When implementing a new treatment, incidence is not affected for a chronic disease. Also, the treatment per se will not affect incidence for an acute disease.

Review Questions

Questions 11–14

Among 245 college students who dedicated one month of summer break to building homes for Habitat for Humanity, 12 developed back strains on the job. Based on the diagram of these 12 episodes of back strain, answer the following questions:



Response options for Questions 11–14:

A. 2/242	E. 3/245	I. 10/244
B. 2/244	F. 8/242	J. 10/245
C. 2/245	G. 8/244	K. 12/245
D. 3/242	H. 8/245	

11. What is the point prevalence rate on July 15, 12:01 AM?
12. What is the point prevalence rate on July 31, 11:59 PM?
13. What is the incidence rate for the period July 15–July 31?
14. What is the period prevalence for July 15–July 31?

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11. **Answer: C.** On July 15, two students had symptoms of back strain (E, K).
12. **Answer: E.** On July 31, three students had symptoms of back strain (B, G, I).
13. **Answer: H.** Eight new cases of back strain had onset between July 15 and July 31 (A, B, D, F, G, I, J, L).
14. **Answer: J.** A total of 10 students had symptoms of back strain at some time during the period July 15–July 31, including two with onset prior to July 15 (E, K) and eight with onset during the period July 15–31 (A, B, D, F, G, I, J, L).

VITAL STATISTICS AND RATES

Birth Rate

Definition: Rate of live births in a population during a time period (usually the calendar year).

Simple formula: $\frac{\text{Live births}}{\text{Population}} \times 1{,}000$

Interpretation: "Births per 1,000 population"

U.S. birth rate: 13.0 births/1,000 population (in 2010)

Fertility Rate

Definition: Rate of live births among women of childbearing age (ages 15–44) in a population during a time period (usually the calendar year).

Simple formula: $\frac{\text{Live births}}{\text{Women of childbearing age}} \times 1{,}000$

Interpretation: "Births per 1,000 women of child-bearing age"

U.S. fertility rate: 64.1 births/1,000 women of child-bearing age (in 2010)

Mortality Rate

Definition: Rate of deaths in a population during a time period (usually the calendar year).

Simple formula: $\frac{\text{Deaths}}{\text{Population}} \times 1{,}000$

Interpretation: "Deaths per 1,000 population."

Synonyms: death rate, crude death rate

U.S. mortality rate: 8.4 deaths/1,000 population (in 2010)

Infant Mortality Rate

Definition: Yearly rate of deaths among children age <1 in relation to the number of live births during the same year. Within a population, the infant mortality rate is a key indication of the population's health status.

Simple formula: $\frac{\text{Infant deaths}}{\text{Live births}} \times 1{,}000$

Interpretation: "Infant deaths per 1,000 live births"

U.S. infant mortality rate: 6.14 infant deaths/1,000 live births (in 2010)

Neonatal mortality rate: $\frac{\text{Infant deaths prior to day 28}}{\text{Live births}} \times 1{,}000$

Postneonatal mortality rate: $\frac{\text{Infant deaths from day 28 through day 365}}{\text{Live births}} \times 1{,}000$

Infant mortality rate: neonatal mortality rate + postneonatal mortality rate

Perinatal mortality rate: Stillbirths and deaths in the first week of life/Live births × 1,000

Infant Mortality

Rates per 1,000 live births (2010)

- Whites: 5.33
- African Americans: 12.40
- Hispanics: 5.39
- Overall: 6.39

Top 3 reasons

- Birth defects: 24% of cases
- Low birth weight (<1,500 grams)/respiratory distress: 18% of cases
- SIDS: 16% of cases

Other facts

- Blacks have highest rates of infant mortality from low birth weight and infections. Number one killer of black infants is low birth weight.
- Native Americans have highest SIDS rate.
- Hispanic profile is similar to whites, but slightly higher.
- SIDS rates reduced sharply by avoiding having infants sleep on their stomachs.

Sociologic risk factors for children

- Maternal immaturity: Risk of premature birth increases dramatically below age 19
- Poverty is a major risk factor for prematurity and other unfavorable outcomes.
- The single-parent family is also correlated with child abuse, childhood suicide, truancy, and delinquency.

Facts about adolescent pregnancy

- Roughly, one million U.S. teenage girls (10% of total) become pregnant each year.
- Of girls aged 15–19 years, 33% have at least one unwanted pregnancy.
- Fifty percent have the child, 20% have spontaneous abortions, and 30% have an elective abortion.
- *More than half of adolescents do not use contraceptives the first time they have intercourse.*

Consequences for teenage pregnancy

For mother. Often drop out of school. Many never work and become welfare dependent.

For child. Neonatal deaths and prematurity are common. Possible lower level of intellectual functioning. Problems for children of single-parent families can include an increased risk of delinquency.

Adolescent sexual behavior

- Eighty percent of boys and 70% of girls are sexually active by the age of 18.
- More than 20% of all sexually active girls become pregnant at least once before the age of 20 years.
- *Pregnancy is the leading cause of school dropout among girls.*
- Roughly 80% of sexually active adolescents do not use birth control.
- *One out of five teenagers will have a sexually transmitted disease.*

Maternal mortality rate

Definition: Yearly rate of deaths in women from causes associated with childbirth in relation to the number of live births during the same year.

Simple formula: $\frac{\text{Maternal deaths}}{\text{Live births}} \times 100{,}000$

Interpretation: "Maternal deaths per 100,000 live births"

U.S. maternal mortality rate: 7.1 maternal deaths/100,000 live births

Case fatality rate (CFR)

Definition: Percentage of cases of an illness or medical condition that result in death within a specified time period.

Simple formula: $\frac{\text{Deaths}}{\text{Cases}} \times 100$

Interpretation: Proportion of cases that end in death (fatality)

Example: In a population of 200 people, 25 become ill, and five die from the illness.

$$\text{CFR} = \frac{5 \text{ Deaths}}{25 \text{ Cases}} \times 100 = 20\%$$

Proportionate mortality rate (PMR)

Definition: Percentage of deaths from all causes that are due to a specified cause during a specified time period.

Simple formula: $\frac{\text{Deaths from a specified cause}}{\text{Total deaths}} \times 100$

Interpretation: Proportion of deaths from a specific cause.

The PMR is used for the most common causes of death in a population.

Table II-1-4. Types of Measured Rates

Crude mortality rate	Deaths per population
Cause-specific mortality rate	Deaths from a specific cause per population
Case-fatality rate	Deaths from a specific cause per number of persons with the disease
Proportionate mortality rate (PMR)	Deaths from a specific cause per all deaths

Review Questions

Rates

Response options for Questions 15–18:

A. Birth rate
B. Fertility rate
C. Infant mortality rate
D. Maternal mortality rate
E. Age-adjusted rate
F. Case-fatality rate
G. Sex-adjusted rate
H. Proportionate mortality rate
I. Age-specific rate
J. Sex-specific rate
K. Age- and sex-specific rate
L. Age- and sex- and race/ethnicity-specific rate

15. Rate of live births among women of childbearing age.
16. The proportion of cases of a disease that die from that disease.
17. Prevalence rate of obesity in women, ages 45–64.
18. Rate of homicide in black men, ages 15–24.

15. **Answer: B.** Restatement of definition of fertility rate.
16. **Answer: F.** Restatement of definition of case-fatality rate.
17. **Answer: K.** Age- and sex-specific rate; prevalence rate restricted to women in the age range 45–64.
18. **Answer: L.** Homicide rate restricted to black men in the age range 15–24.

Review Questions

Questions 19 and 20 are based on the following table:

Incidence and Mortality of Disease

Age	Disease A		Disease B		Total	
Groups	Cases	Deaths	Cases	Deaths	Deaths	Population
0–12	2	1	300	1	40	22,000
13–24	101	34	267	0	30	18,000
25–64	50	42	1,042	2	125	50,000
>64	0	0	986	95	303	30,000
Totals	153	77	2,595	98	498	120,000

19. The case-fatality rate for Disease A is

    A. 77/120,000 × 1,000
    B. 77/120,000 × 100,000
    C. 153/120,000 × 100,000
    D. 153/498 × 100
    E. 77/153 × 100

20. The proportionate mortality rate for Disease B is

    A. 98/120,000 × 100,000
    B. 2,595/120,000 × 100,000
    C. 98/2,595 × 100
    D. 98/498 × 100
    E. Cannot be determined

19. **Answer: E.**
20. **Answer: D.**

YEARS OF POTENTIAL LIFE LOST AND SURVIVAL ANALYSIS

Years of Potential Life Lost (YPLL) (indicator of premature death):

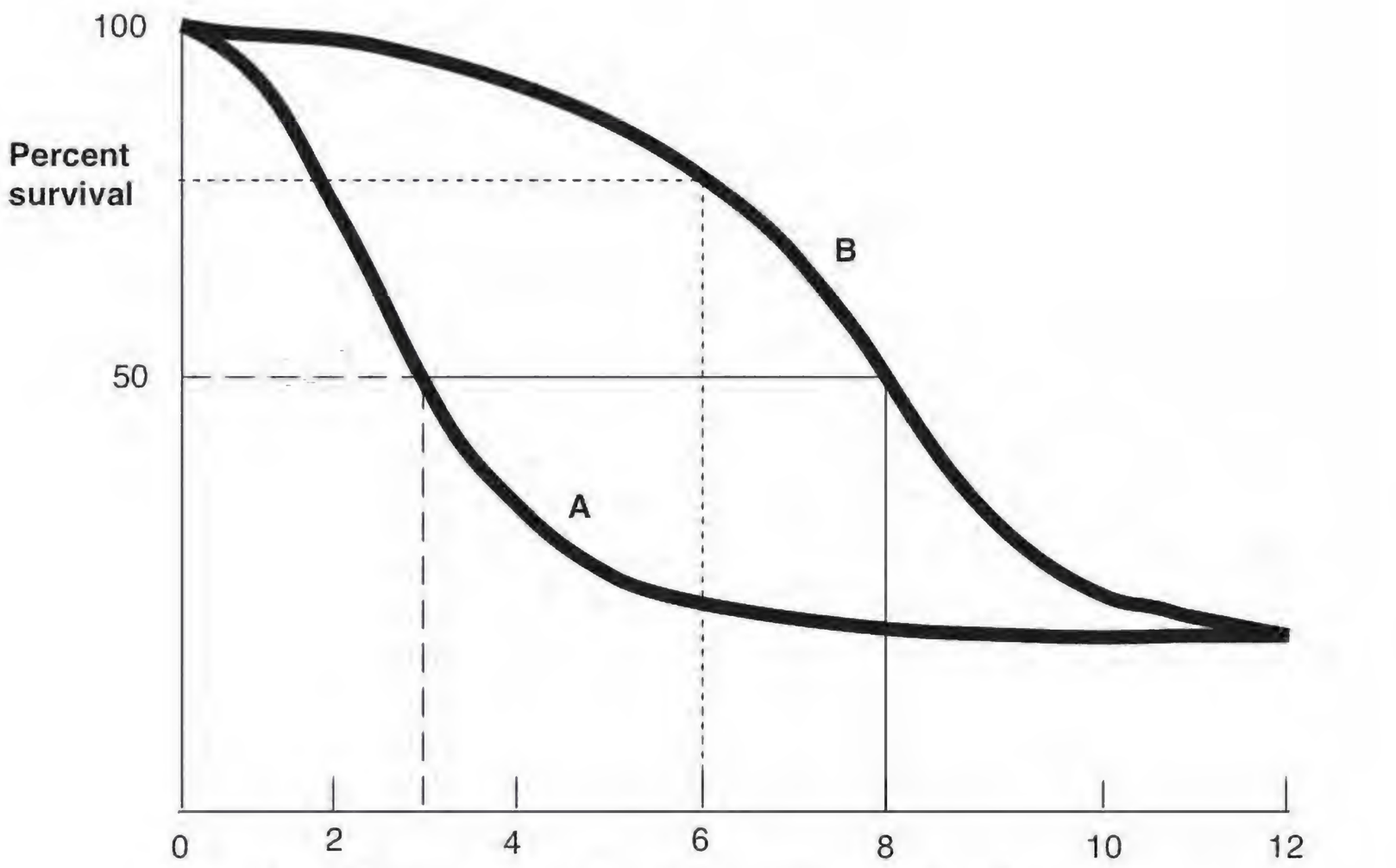
The YPLL for a particular cause of death is the sum, over all persons dying from the cause, of the years that these persons would have lived had they experienced normal life expectancy. Assume life expectancy is 75 years. A person who dies at age 65 would be dying 10 years prematurely (75 − 65 = 10 YPLL). For 100 such people, the YPLL calculation would be: 100 × (75 − 65) = 1,000 YPLL.

- In the United States, the leading cause of YPLL is **unintentional injury** before age 65.

Survival Analysis

Survival analysis is a class of statistical procedures for estimating the proportion of people who survive in relation to the length of survival time. The starting point is 100% survival. In 2000, the median survival time was 78 years.

A survival curve is a curve that starts with 100% of the study population and shows the percentage of the population still surviving at successive times for as long as information is available.



— — - Median survival time for people in condition A.

——— Median survival time for people in condition B.

-------- Interpretations: 75% of people in condition B survive 6 months. Or, at 6 months, 75% of people in condition B are surviving (survival percent).

Figure II-1-5. Survival Curve

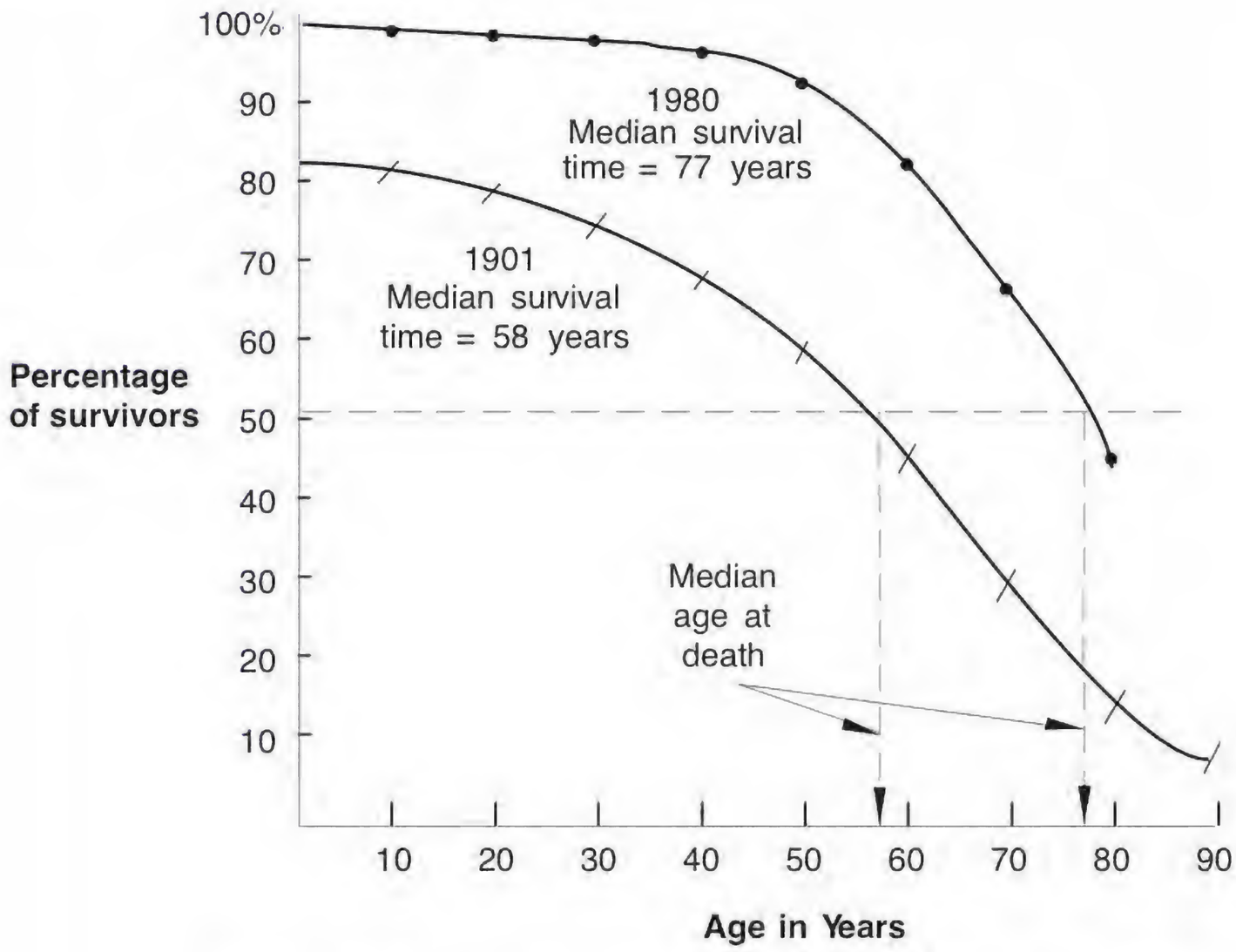


Figure II-1-6. Percentage of Survivors at Specified Ages, 1901 and 1980

UNDERSTANDING SCREENING TESTS

Definition. Screening is the process of using tests to permit early detection of risk factors, asymptomatic infection, or early stages of clinical disease, thus permitting early diagnosis and early intervention or treatment.

- Screening is usually applied to populations of apparently well individuals. Illness, if present, is asymptomatic (subclinical, inapparent).
- Screening tests allow for earlier detection and earlier diagnosis. Hopefully, earlier treatment will effect a more favorable clinical course.
- Screening test results are classified as "positive" (presumed by the test to be diseased) or "negative" (presumed by the test to be well).

Classic 2 × 2 Table

The 2 × 2 table is the standard form for displaying screening test results in relation to disease status. Disease status categories (diseased and well) are diagrammed in the vertical columns. Screening test results (positive, negative) are diagrammed in the horizontal dimension.

Table II-1-5. Classic 2 × 2 Table

	Disease	No Disease	Totals
Positive	True Positive [TP]	False Positive [FP]	TP + FP
Negative	False Negative [FN]	True Negative [TN]	TN + FN
Totals	TP + FN	TN + FP	TP + TN + FP + FN

Cells in the 2 × 2 Table

- Positive (P) and Negative (N) refer to the actual screening test results.
- True (T) and False (F) refer to the agreement of screening test results with the "gold standard."
- True Positives: Diseased people who are correctly classified as positive.
- True Negatives: Well people who are correctly classified as negative.
- False Positives: Well people who are misclassified as positive.
- False Negatives: Diseased people who are misclassified as negative.

Table II-1-6. Screening Results in a 2 × 2 Table

		Disease				
		Present		Absent		Totals
Screening Test Results	Positive	TP	80	FP	40	TP + FP
	Negative	FN	20	TN	60	TN + FN
	Totals	TP + FN		TN + FP		TP + TN + FP + FN

TP = true positives; TN = true negatives; FP = false positives; FN = false negatives

Measures of Screening Test Performance

Sensitivity and Specificity

1. **Sensitivity:** The proportion of people with disease who are correctly classified by the screening test as positive.
   - Sensitivity = TP/All people with disease
   - *Sensitivity = TP/(TP + FN)*
   - Location on 2 × 2 table: left column
   - Highly sensitive tests identify most, if not all, possible cases
   - Important to consider when there is a consequence associated with missing the detection of disease

2. **Specificity:** The proportion of well people who are correctly classified by the screening test as negative.
   - Specificity = TN/All well people
   - *Specificity = TN/(TN + FP)*
   - Location on 2 × 2 table: right column
   - Highly specific tests identify most, if not all, well people (i.e., not diseased), will give few FP results
   - Considered when FP results can harm the patient

3. **Predictive Values:** A measure of the test which represents the percentage of test results that match the diagnosis of the patient. These values are predicted by the disease prevalence in the given population.

3a. **Positive Predictive Value (PPV):** The proportion of people with a positive screening test result who are diseased. (i.e., that a person with a positive test is a true positive)

- Positive Predictive Value = TP/All people with a positive test result
- *Positive Predictive Value = TP/(TP + FP)*
- Location on 2 × 2 table: top row
- ↑ specificity = ↑ PPV

3b. **Negative Predictive Value (NPV):** The proportion of people with a negative screening test result who are well. (i.e., that a person with a negative test is a true negative)

- Negative Predictive Value = TN/All people with a negative test result
- *Negative Predictive Value = TN/(TN + FN)*
- Location on 2 × 2 table: bottom row
- ↑ sensitivity = ↑ NPV

4. **Accuracy:** The proportion of all screened people who are correctly classified by the screening test.
   - Accuracy = (TP + TN)/All screened people
   - *Accuracy = (TP + TN)/(TP + TN + FP + FN)*
   - Location on 2 × 2 table: main diagonal
   - Can be used to summarize overall value of a test

5. **Prevalence:** The proportion of screened people who have disease.
   - Prevalence can be estimated only if the entire population or a representative sample of the population is screened.
   - *Prevalence = (TP + FN)/(TP + TN + FN + FP)*
   - ↑ prevalence of a disease usually equals ↑ PPV and ↓ NPV
   - ↓ prevalence of a disease usually equals ↓ PPV and ↑ NPV

6. **Likelihood ratio:** The expression of how many more (or less) likely a test result is to be found in nondiseased (or diseased) compared with diseased (or nondiseased).
   - Positive likelihood ratio (LR+) is the proportion of diseased people to that of nondiseased people with a positive test result

$$\text{LR+} = \frac{\text{Sensitivity}}{1 - \text{specificity}} \text{ OR } \frac{\text{Sensitivity}}{\text{FP}/(\text{TN} + \text{FP})}$$

   - Negative likelihood ratio (LR-) is the proportion of diseased people to that of nondiseased people with a negative test result

$$\text{LR–} = \frac{1 - \text{sensitivity}}{\text{Specificity}} \text{ OR } \frac{\text{FN}/(\text{TP} + \text{FN})}{\text{Specificity}}$$

Screening Test Diagram

The screening test diagram displays the distributions of the screening test measure separately for people with disease and people with no disease.

The cutoff point or criterion point divides screened people into test-positives and test-negatives.

People with no disease (Figure 1-7; solid line) are either correctly classified as TN or misclassified as FP. Diseased people (Figure 1-7; dashed line) are either correctly classified as TP or misclassified as FN.

The screening test diagram is a useful model of the real world in which values of screening test measures (such as blood pressure) are generally different for diseased (hypertensive) and non-diseased (normotensive) people, but the distributions overlap.

The measures of screening test performance can be displayed on the screening test diagram by identifying the appropriate areas under the curves. For example, the numerator for sensitivity is TP, whereas the denominator is everyone under the curve labeled "disease."

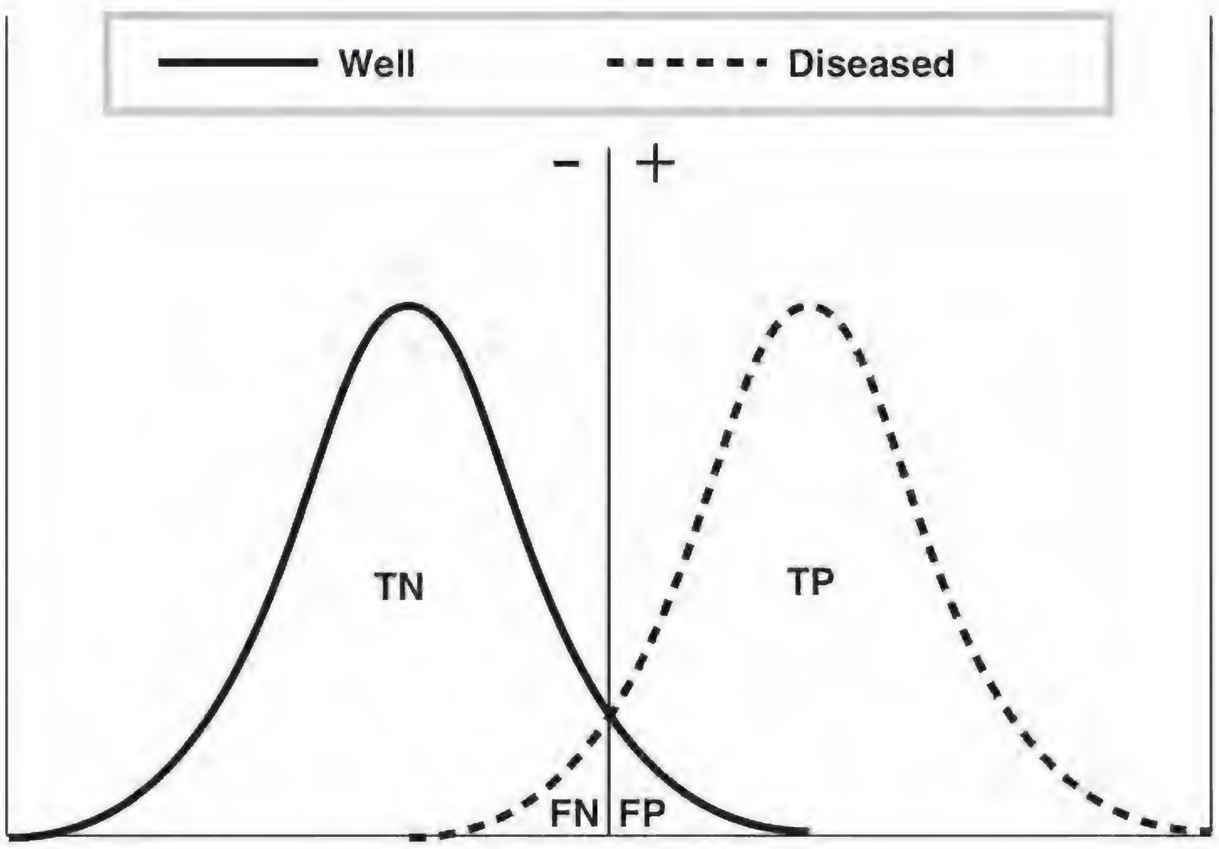


Figure II-1-7. Screening Test Diagram

Table II-1-7. Summarized 2 x 2 Tables

		Disease		Predictive Values	
Measure		**Present**	**Absent**	**Equation**	**Notes**
	Positive	TP	FP	$PPV = \frac{TP}{TP + FP}$	Each value looks at a 'positive'
	Negative	FN	TN	$NPV = \frac{TN}{TN + FN}$	Each value looks at a 'negative'
Screening Test Measures	**Equation**	$Sensitivity = \frac{TP}{TP + FN}$		$Specificity = \frac{TN}{TN + FP}$	
	Notes	Want to identify all possible causes. Use everything in 'diseased' column = TP + FN.		Want to more specifically identify those that do not have disease. Use everything in 'no diseased; column.	

Review Questions

Screening Tests

A new screening test is applied to a representative sample of 1,000 people in the population. Based on the data presented in the following table, calculate the requested screening test measures.

	Diseased	Well	
Positive	90	60	150
Negative	10	840	850
	100	900	1,000

Response options for Questions 21–26:

A. 90/150
B. 90/100
C. 90/1,000
D. 90
E. 60
F. 10
G. 840/850
H. 840/900
I. 930/1,000
J. 900/1,000
K. 100/1,000
L. Cannot be calculated

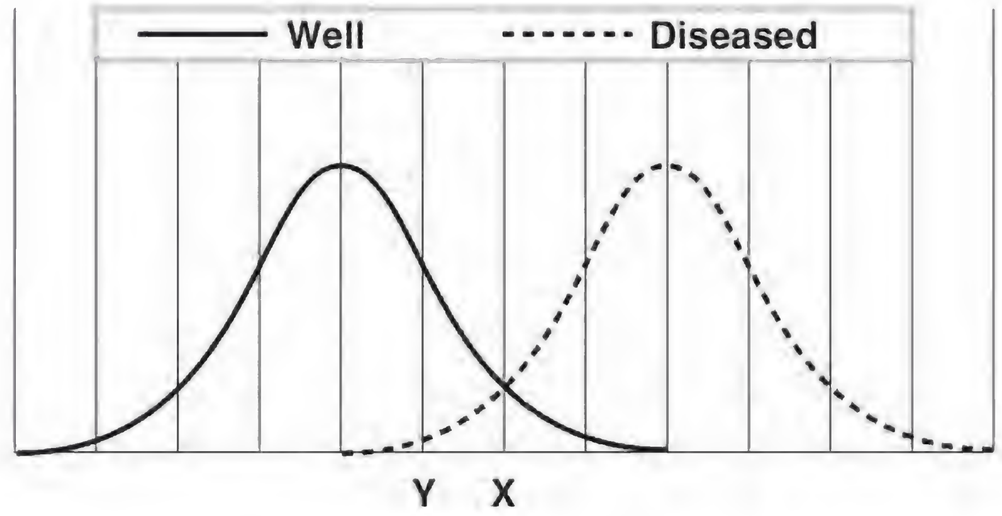
21. What is the sensitivity of the screening test?
22. What is the specificity of the screening test?
23. What is the positive predictive value of the screening test?
24. What is the accuracy of the screening test?
25. What is the number of false positive test results?
26. What is the prevalence of disease, assuming screening of a representative sample?

21. **Answer: B.** Sensitivity = TP/All diseased people = 90/100
22. **Answer: H.** Specificity = TN/All well people = 840/900
23. **Answer: A.** PPV = TP/All test positives = 90/150
24. **Answer: I.** Accuracy = (TP + TN)/All screened people = 930/1,000
25. **Answer: E.** False positives = Well people who are misclassified by the test = 60
26. **Answer: K.** Prevalence = All diseased people/All screened people = 100/1,000

Review Questions

Questions 27–32

The Centers for Disease Control and Prevention is concerned about optimizing the detection of a disease that poses a serious public health threat. CDC health officials are considering lowering the usual screening test cutoff point from X to Y.



27. Moving cutoff in the manner being considered by the CDC causes the number of false positives to
    A. increase
    B. decrease
    C. remain unchanged
    D. cannot be determined

28. Moving the cutoff in the manner being considered by the CDC causes the positive predictive value to
    A. increase
    B. decrease
    C. remain unchanged
    D. cannot be determined

29. Moving the cutoff in the manner being considered by the CDC causes the accuracy to
    A. increase
    B. decrease
    C. remain unchanged
    D. cannot be determined

30. Moving the cutoff in the manner being considered by the CDC causes the sensitivity to
    A. increase
    B. decrease
    C. remain unchanged
    D. cannot be determined

31. Assuming that everyone who receives a positive test result is referred for medical follow-up, moving the cutoff in the manner being considered by the CDC will cause the numbers of screened people who are referred for follow-up to
    A. increase
    B. decrease
    C. remain unchanged
    D. Cannot be determined

(*Continued*)

Review Questions (*continued*)

32. At Cutoff Point X, sensitivity is
    A. 100%
    B. 85%
    C. 50%
    D. 25%
    E. 0%

27. **Answer: A.** At Y, FP will increase as more well people are misclassified.

28. **Answer: B.** Although there will be more TP at Cutoff Y, there will be a large increase in numbers of FP. The ratio, TP/(TP + FP), will decrease. A positive test result will be less predictive of actual disease.

29. **Answer: B.** X is the point of overlap and the point of maximal accuracy. Moving to Y will decrease accuracy.

30. **Answer: A.** At Y, more diseased people will receive a (correct) positive test result. They will be TP. TP, the numerator for sensitivity, will increase while the denominator (total people with disease) will be unchanged.

31. **Answer: A.** Larger numbers of people would be screened positive at Cutoff Y and referred for follow-up.

32. **Answer: B.** Notice that Cutoff Point X separates the curve of diseased people into two areas; above the cutoff point, approximately 85% of diseased people receive a (correct) positive test result. They are true positives. Sensitivity = TP /All people with disease.

Review Questions

33. A physician interviews an 18-year-old female patient who mentions that she has just received a negative syphilis test result from the county health department. She describes her sense of relief at receiving the test result. She discloses that she is a sex worker who "works the stroll" four to five nights a week. She has been "tricking" for the past 18 months. Typically, she has oral or vaginal sex with five to eight customers per night. For a higher fee, she will have sex without requiring her customer to wear a condom. On the basis of these findings, the physician is likely to be most concerning with which of the following screening test measures?
    A. Sensitivity
    B. Specificity
    C. Positive predictive value
    D. Negative predictive value
    E. Accuracy

(*Continued*)

Review Questions (*continued*)

34. A 55-year-old man visits his primary care physician with a complaint of urinary infrequency. Examination finds a 1-cm nodule on his prostate gland. The physician orders a prostate-specific antigen (PSA) serum test. By common standards, a PSA level >4 ng/mL is considered abnormal. Using this standard, this test has a sensitivity of 80% and a specificity of 90%. A recently published epidemiologic article found that in a cross-sectional study, 10% of men of this age have prostate cancer. The result on the patient's PSA is 7 ng/mL. What is your best estimate of the likelihood that this man actually has prostate cancer?

    A. 13%
    B. 25%
    C. 36%
    D. 47%
    E. 58%
    F. 69%
    G. 72%
    H. 81%

33. **Answer: D.**
34. **Answer: D.**

STUDY DESIGNS

The following form is used for displaying the relationship of exposure to disease status:

Table II-1-8. 2 × 2 Table Format

	Disease	No Disease	
Exposed	a	b	a + b
Nonexposed	c	d	c + d
	a + c	b + d	a + b + c + d

When epidemiologists observe the relationships between exposures and disease outcomes in free-living populations, they are conducting observational studies. When epidemiologists or clinicians test interventions aimed at minimizing the disease-producing exposures and optimizing health-promoting exposures or factors, they are performing experimental studies.

In **observational studies**, nature is allowed to take its course; no intervention.

In **experimental studies**, there is an intervention and the results of the study assess the effects of the intervention.

Observational Studies

Case report: Brief, objective report of a *clinical characteristic or outcome from a single clinical subject or event*, $n = 1$. For example, a 23-year-old man with treatment-resistant TB. No control group.

Case series report: Objective report of a *clinical characteristic or outcome from a group of clinical subjects*, $n > 1$, i.e., patients at local hospital with treatment-resistant TB. No control group.

Cross-sectional study: The *presence or absence of disease and other variables* are determined in each member of the study population or in a representative sample *at a particular time*. The co-occurrence of a variable and the disease can be examined.

- Disease prevalence rather than incidence is recorded.
- The temporal sequence of cause and effect cannot usually be determined in a cross-sectional study, e.g., who in the community now has treatment-resistant TB.

Case-control study: Identifies *a group of people with the disease and compares them with a suitable comparison group without the disease*. It is almost always retrospective, e.g., comparing cases of treatment-resistant TB with cases of nonresistant TB.

- Cannot assess incidence or prevalence of disease
- Can help determine causal relationships
- Very useful for studying conditions with very low incidence or prevalence

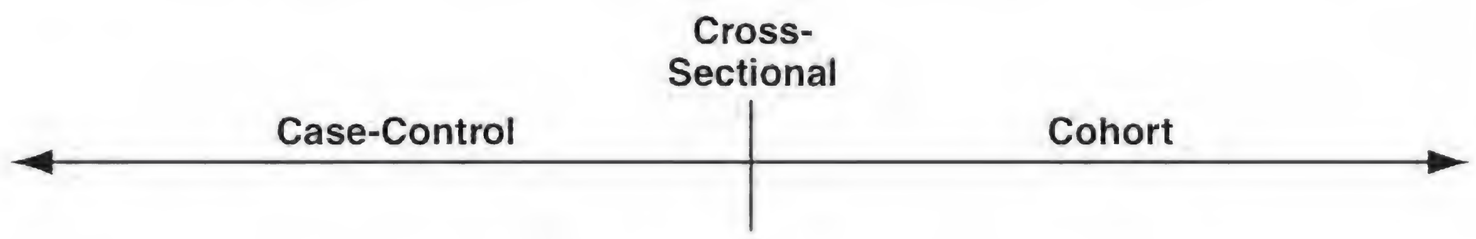


Figure II-1-8. Differentiating Study Types by Time

Cohort study: Population group is identified who has been *exposed to risk factor* is followed over time and *compared with a group not exposed to the risk factor*. Outcome is disease incidence in each group, e.g., following a prison inmate population and marking the development of treatment-resistant TB.

- Allows you to evaluate whether potential risk factors are related to subsequent outcomes
- Prospective; subjects tracked forward in time
- Can determine incidence and causal relationships
- Must follow population long enough for incidence to appear
- Historical examples: Framingham study

Analyzing Observational Studies (measure of effect)

For cross-sectional studies, use Chi-square (χ^2); for cohort studies, use relative risk and/or attributable risk.

Relative risk (RR): Comparative probability asking, "How much more likely is the exposed person going to get the disease compared to the nonexposed?"

- Incidence rate of exposed group *divided by* the incidence rate of the unexposed group. How much greater chance does one group have of contracting the disease compared with the other group?

- For example, if infant mortality rate in whites is 8.9 per 1,000 live births and 18.0 in blacks per 1,000 live births, then the relative risk of blacks versus whites is 18.0 divided by 8.9 = 2.02. Compared with whites, black infants are twice as likely to die in the first year of life.
- For statistical analysis, it yields a *p* value.

Attributable risk (AR) (Also called absolute risk reduction): Comparative probability asking, "How many more cases in one group?"

- Incidence rate of exposed group *minus* the incidence rate of the unexposed group
- Using the same example, attributable risk is equal to 18.0 – 8.9 = 9.1. Of every 1,000 black infants, there were 9.1 more deaths than were observed in 1,000 white infants. In this case, attributable risk gives the excess mortality.
- Note that both relative risk and attributable risk tell us if there are differences but do not tell us why those differences exist.

For case-control studies: Use odds ratio (OR).

Odds ratio (OR): Looks at the increased odds of getting a disease with exposure to a risk factor versus nonexposure to that factor.

- Odds of exposure for cases divided by odds of exposure for controls
- The odds that a person with lung cancer was a smoker versus the odds that a person without lung cancer was a smoker

Table II-1-9. Odds Ratio

	Lung Cancer		No Lung Cancer	
Smokers	659	(A)	984	(B)
Nonsmokers	25	(C)	348	(D)

$$OR = \frac{A/C}{B/D} = \frac{AD}{BC}$$

Use OR = AD/BC as the working formula.

For the above example:

$$OR = \frac{AD}{BC} = \frac{659 \ \ 348}{984 \ \ 25} = 9.32$$

- The odds of having been a smoker are more than nine times greater for someone with lung cancer compared with someone without lung cancer.
- OR approaching 1 = increased risk of outcome with exposure

Review Questions

Study Design

35. How would you analyze the data from this case-control study?

	No Colorectal Cancer	Colorectal Cancer	TOTALS
Family history of colorectal cancer	120	60	180
No family history of colorectal cancer	200	20	220
TOTALS	320	80	400
ANSWER:	$\frac{AD}{BC}$	$\frac{(60)(200)}{(120)(20)}$	OR = 5.0

Explanation

35. This means that the odds of having a family history of colorectal cancer are 5 times greater for those who have the desease than for those who do not.

Table II-1-10. Differentiating Observational Studies

Characteristic	Cross-Sectional Studies	Case-Control Studies	Cohort Studies
Time	One time point	Retrospective	Prospective
Incidence	No	No	Yes
Prevalence	Yes	No	No
Causality	No	Yes	Yes
Role of disease	Measure disease	Begin with disease	End with disease
Assesses	Association of risk factor and disease	Many risk factors for single disease	Single risk factor affecting many diseases
Data analysis	Chi-square to assess association	Odds ratio to estimate risk	Relative risk to estimate risk

Table II-1-11. Computational Measures by Type of Observational Study

Measure	Cross-Sectional Study	Case-Control Study	Cohort Study
Prevalence of disease	Yes	No	No
Prevalence of exposure	Yes	No	No
Odds ratio	No	Yes	No
Incidence rate in the exposed	No	No	Yes
Incidence rate in the nonexposed	No	No	Yes
Relative risk	No	No	Yes
Attributable risk	No	No	Yes

Experimental Studies: Clinical Trials

Clinical trials (intervention studies): Research that involves the administration of a test regimen to evaluate its safety and efficacy.

- **Control group:** Subjects who do not receive the intervention under study; used as a source of comparison to be certain that the experiment group is being affected by the intervention and not by other factors. In clinical trials, this is most often a placebo group. Note that control group subjects must be *as similar as possible to intervention group* subjects.
- For Food and Drug Administration (FDA) approval, 3 phases of clinical trials must be passed.

  Phase 1: Testing safety in healthy volunteers

  Phase 2: Testing *protocol and dose levels* in small group of patient volunteers

  Phase 3: Testing *efficacy and occurrence of side effects* in larger group of patient volunteers. Phase 3 is considered the definitive test.

- **Randomized controlled clinical trial (RCT):**
  1. Subjects in study are *randomly allocated* into "intervention" and "control" groups to receive or not receive an experimental preventive or therapeutic procedure or intervention.
  2. Generally regarded as *the most scientifically rigorous* studies available in epidemiology.
  3. **Double-blind RCT** is the type of study *least subject to bias*, but also the *most expensive* to conduct. Double-blind means that neither subjects nor researchers who have contact with them know whether the subjects are in the treatment or comparison group.
- **Community trial:** Experiment in which the unit of allocation to receive a preventive or therapeutic regimen is an *entire community or political subdivision.* Does the treatment work in real world circumstances?
- **Crossover study:** For ethical reasons, no group involved can remain untreated. *All subjects receive intervention* but at different times (e.g., AZT trials). Assume double-blind design. For example, Group A receives AZT for 3 months; Group B is control. For the second 3 months, Group B receives AZT and Group A is control.

Table II-1-12. Comparison of Case-Control and Cohort Studies

Case-Control Study	Cohort Study
Small number of subjects	Large number of subjects
Lower cost	Higher cost
Short time period	Longer time period
One disease: multiple past exposures	**One exposure: multiple future diseases**
Low prevalence or high prevalence diseases	High incidence diseases only
Major source of bias: recall	Major source of bias: selection

STUDY DESIGNS: BIAS IN RESEARCH

Bias in research

Bias in research is deviation from the truth of inferred results.

Reliability: Ability of a test to *measure something consistently*, either across testing situations (test–retest reliability), within a test (split half reliability), or across judges (inter-rater reliability). Think of the clustering of rifle shots at a target (*precision*).

Validity: Degree to which a test measures that which was intended. Think of a marksman hitting the bulls-eye. Reliability is a necessary, but insufficient, condition for validity (*accuracy*).

Types of bias

Selection bias (sampling bias): The *sample selected is not representative* of the population. Examples:

- Predicting rates of heart disease by gathering subjects from a local health club
- Using only hospital records to estimate population prevalence (Berkson's bias)
- People included in study are different from those who are not (nonrespondent bias)

Measurement bias: Information is gathered in a manner that distorts the information. Examples:

- Measuring patients' satisfaction with their respective physicians by using leading questions, e.g., "You don't like your doctor, do you?"
- Subjects' behavior is altered because they are being studied (Hawthorne effect). This is a factor only when there is no control group in a prospective study.

Experimenter expectancy (Pygmalion effect): *Experimenter's expectations inadvertently communicated to subjects*, who then produce the desired effects. Can be avoided by **double-blind** design, where neither the subject nor the investigators who have contact with them know which group receives the intervention under study and which group is the control.

Lead-time bias: Gives a *false estimate of survival rates*. For example, patients seem to live longer with the disease after it is uncovered by a screening test. Actually, there is no increased survival, but because the disease is discovered sooner, patients who are diagnosed seem to live longer.

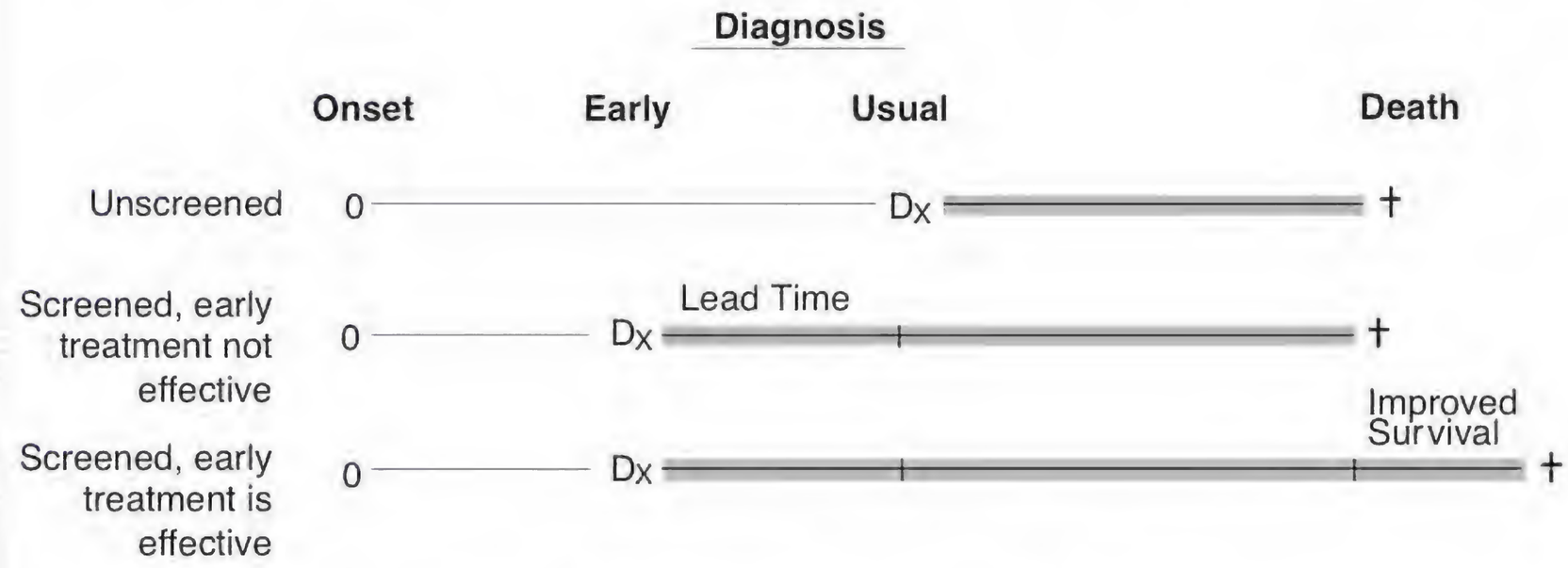


Figure 1-9. Diagnosis, Time, and Survival

Recall bias: Subjects *fail to accurately recall events* in the past. For example, "How many times last year did you kiss your mother?" This is a likely problem in retrospective studies.

Late-look bias: *Individuals with severe disease are less likely to be uncovered in a survey because they die first.* For example, a recent survey found that persons with AIDS reported only mild symptoms.

Confounding bias: *The factor being examined is related to other factors of less interest.* Unanticipated factors obscure a relationship or make it seem like there is one when there is not. More than one explanation can be found for the presented results. An example would be comparing the relationship between exercise and heart disease in two populations when one population is younger and the other is older. Are differences in heart disease due to exercise or to age?

Table II-1-13. Type of Bias in Research and Important Associations

Type of Bias	Definition	Important Associations	Solutions
Selection	Sample not representative	Berkson's bias, nonrespondent bias	Random, independent sample
Measurement	Gathering the information distorts it	Hawthorne effect	Control group/placebo group
Experimenter expectancy	Researcher's beliefs affect outcome	Pygmalion effect	Double-blind design
Lead-time	Early detection confused with increased survival	Benefits of screening	Measure "back-end" survival
Recall	Subjects cannot remember accurately	Retrospective studies	Confirm information with other sources
Late-look	Severely diseased individuals are not uncovered	Early mortality	Stratify by severity
Confounding obscure results	Unanticipated factors	Hidden factors affect results	Multiple studies, good research design

Review Questions

Response options for Questions 36–41:

A. 520/695
B. 600/1,000
C. 520/600
D. 695/1,000
E. 80/305
F. (520/695)/(80/305)
G. (520 × 225)/(175 × 80)
H. (520/695) – (80/305)
I. Cannot be determined for this type of study

	Disease	Well	
Exposed	520	175	695
Nonexposed	80	225	305
	600	400	1,000

36. Assume the table represents a cohort study: What is the incidence rate in the exposed?
37. Assume the table represents a cross-sectional study: What is the relative risk?
38. Assume the table represents a case-control study: What is the odds ratio?
39. Assume the table represents a cross-sectional study: What is the prevalence of disease?
40. Assume the table represents a disease outbreak investigation: What is the attack rate for people who did not eat the food?
41. Assume the table represents a cohort study: What is the attributable risk?
42. A study compares the effectiveness of a new medication for treatment of latent tuberculosis infection with the standard medication, isoniazid. Subjects with latent TB infection are sorted with equal likelihood of selection to receive the new medication or isoniazid. Neither the subjects themselves nor the clinicians know the treatment condition for each patient. This study is best described as a

A. double-blind randomized cohort study
B. randomized controlled trial with crossover design
C. double-blind randomized clinical trial
D. double-blind randomized clinical trial with crossover design
E. double-blind quasi-experimental trial

(*Continued*)

Review Questions (*continued*)

36. Answer: A.

37. Answer: I.

38. Answer: G.

39. Answer: B.

40. Answer: E.

41. Answer: H.

42. Answer: C.

Review Questions

43. A group of 200 hypertensive subjects and a comparable group of 200 normotensive subjects are recruited and enrolled into a longitudinal study to examine the effect of a diagnosis of hypertension on subsequent occurrence of coronary heart disease. Study subjects are followed for 5 years. Final data are presented in the table below. What is the attributable risk for hypertension?

	CHD	No CHD	Total
Hypertension	25	175	200
No hypertension	10	190	200
Total	35	365	400

A. 0.075
B. 2.5
C. 2.7
D. 0.125
E. Cannot be computed for this type of study

44. A study is conducted relating percentage of calories from fat in the habitual diet to subsequent incidence of clinical diabetes mellitus. Four groups of inially well persons are selected from the community to represent persons within each of four categories of fat intake. The percentages of daily calories from fat are: <20%, 20–40%, 35–49%, >50%. The groups are followed longitudinally for 5 years and assessed annually for diabetes. The type of study design is best described as a

A. case-series trial
B. case-control study
C. cross-sectional study
D. cohort study
E. community trial

(*Continued*)

Review Questions (*continued*)

45. Alcohol consumption and cigarette smoking both contribute causally to the occurrence of esophageal cancer. These risk factors are not independent; in fact, they operate synergistically. A study of cigarette smoking in relation to esophageal cancer that fails to stratify or otherwise control for level of alcohol consumption would be guilty of which of the following threats to validity?

    A. Ascertainment bias
    B. Confounding
    C. Design bias
    D. Lead time bias
    E. Observer bias
    F. Recall bias
    G. Response bias
    H. Selection bias

43. **Answer: A.**

44. **Answer: D.**

45. **Answer: B.**

Biostatistics 2

PROBABILITY BASICS

Combine probabilities for independent events by multiplication.

- Events are independent if the occurrence of one tells you nothing about the occurrence of another.
- If the chance of having blond hair is 0.3 and the chance of having a cold is 0.2, the chance of meeting a blond-haired person with a cold is $0.3 \times 0.2 = 0.06$ (or 6%).
- If events are nonindependent, then multiply the probability of one times the probability of the second, given that the first has occurred. For example, if one has a box with 5 white and 5 black balls in it, the chance of picking two black balls is $(5/10) \times (4/9) = 0.5 \times 0.44 = 0.22$ (or 22%).

Combine probabilities for mutually exclusive events by addition.

- Mutually exclusive means that the occurrence of one event precludes the occurrence of the other (i.e., cannot both happen). If a coin lands heads, it cannot be tails; the two are mutually exclusive. For example, if a coin is flipped, the chance that it will be either heads or tails is $0.5 + 0.5 = 1.0$ (or 100%).
- If two events are not mutually exclusive, the combination of probabilities is accomplished by adding the two together and subtracting out the multiplied probabilities. For example, if the chance of having diabetes is 10%, and the chance of someone being obese is 30%, the chance of meeting someone who is obese or had diabetes is $0.1 + 0.30 - (0.1 \times 0.30) = 0.37$ (or 37%).

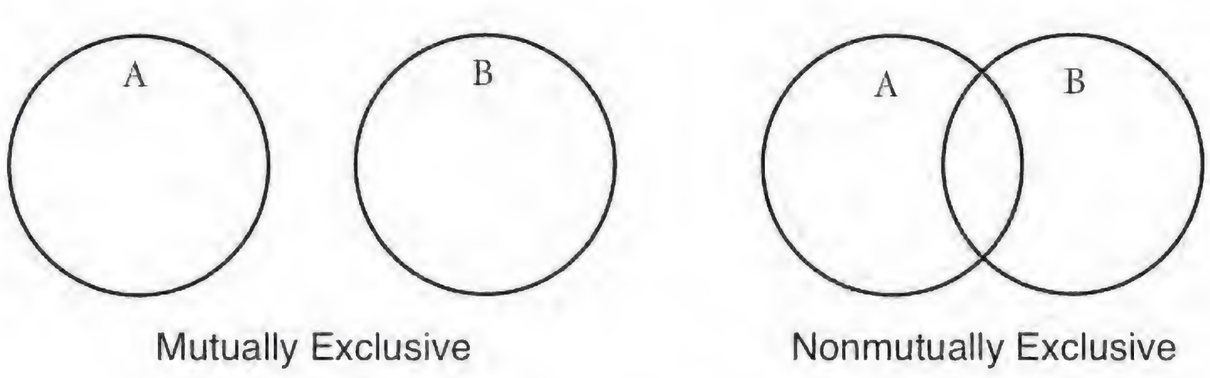


Figure II-2-1. Venn Diagram Representations of Mutually Exclusive and Nonmutually Exclusive Events

Table II-2-1. Survival Rates After Surgery

N	1 Year	2 Year	3 Year	4 Year
183	90%	75%	50%	40%

1. What is the life expectancy after surgery? (3 years)
2. If a patient survives for 2 years, what is the chance of surviving for 3 years? (50/75)
3. In an effort to evaluate healthy lifestyle influences at home, a study is conducted to see how many pediatric patients have parents who exercise regularly. Parents at pediatric offices are questioned and it is concluded that 40% of pediatric patients have parents who exercise regularly. Assuming the events are independent, what is the probability that 2 pediatric patients with parents who exercise regularly will come into the office on the same day?

   (A) 0.16
   (B) 0.4
   (C) 0.8
   (D) 0.96
   (E) 0.08
   (F) 0.04

(choice A; this requires the multiplication rule)

DESCRIPTIVE STATISTICS

Measures (Indices) of Central Tendency

Measures of central tendency is a general term for several characteristics of the distribution of a set of values or measurements around a value at or near the middle of the set.

Mean (synonym: "average"): The sum of the values of the observations divided by the numbers of observations.

$$\text{Mean: } \frac{\text{Sum of the observed measurements}}{\text{Number of observations}}$$

Median:

- The simplest division of a set of measurements is into two parts—the upper and lower half.
- The point on the scale that divides the group in this way is the median.
- The measurement below which half the observations fall: the 50th percentile.

Mode: The most frequently occurring value in a set of observations.

Normal Distribution

Normal distribution is continuous frequency distribution of infinite range defined by a specific mathematical function with the following properties:

- A continuous, symmetrical distribution; both tails extend to infinity.
- The arithmetic mean, mode, and median are identical.
- The shape is completely determined by the mean and standard deviation.

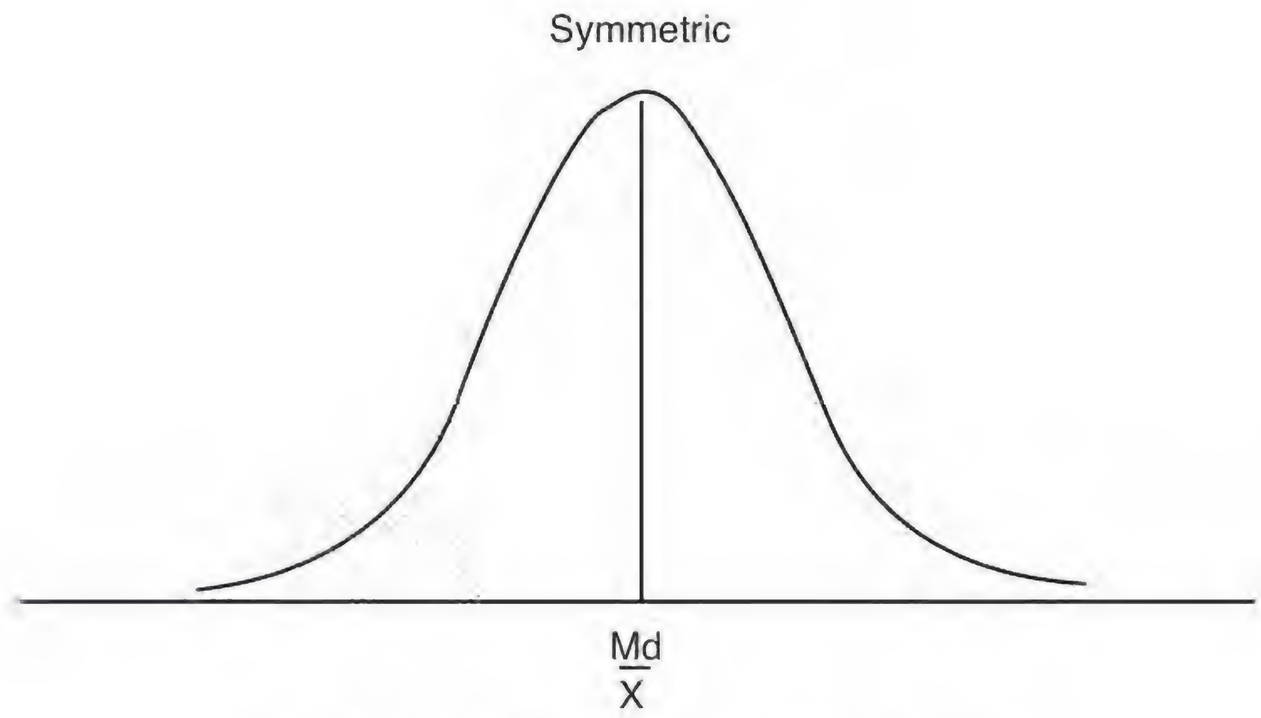


Figure II-2-2. Measures of Central Tendency

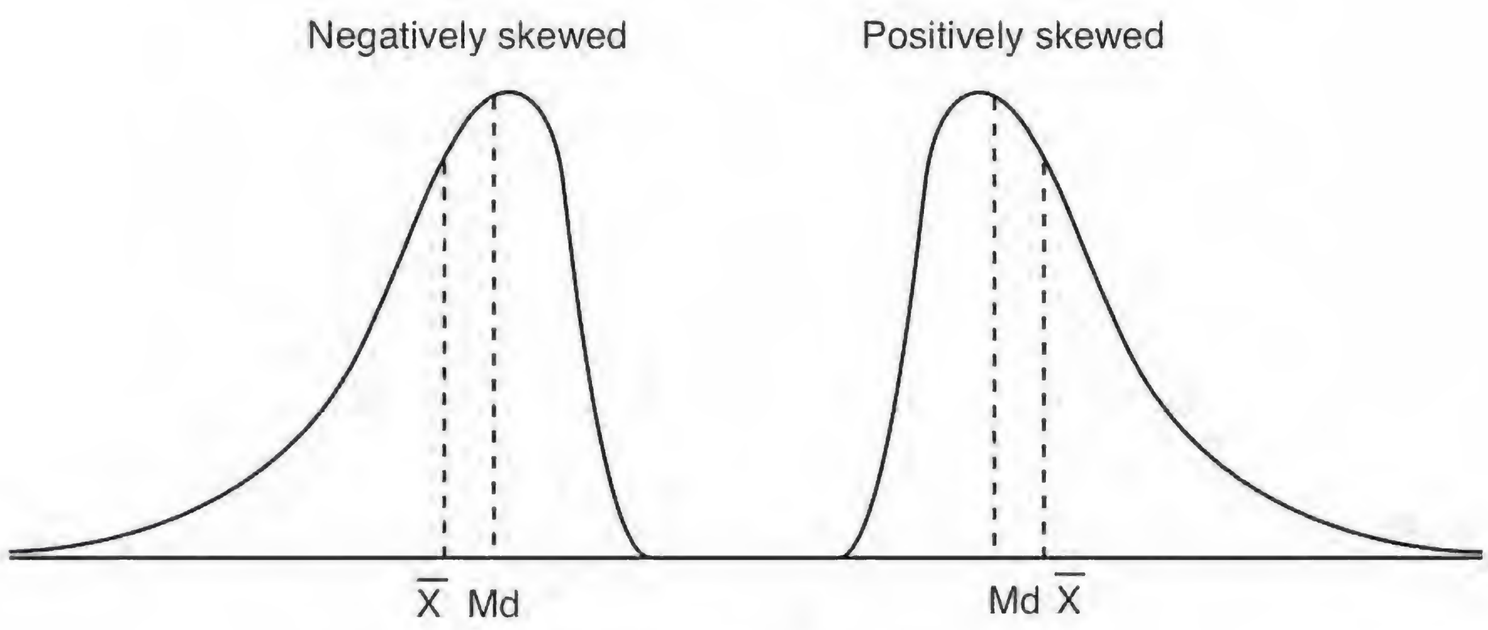


Figure II-2-3. Skewed Distribution Curves

Dispersion of Data

The dispersion of data helps us identify the spread, or the variation, of the data.

Deviation score: The distance from the mean. Found by subtracting the distribution mean from the distribution values you are evaluating. For example, the mean of the distribution is 120 and you want to know the deviation score of the value 150.

$x = 150 - 120$

$= 30$

This is used to obtain the variance of a distribution.

Range: The difference between the largest and smallest values in a distribution.

Variance: A measure of the variation shown by a set of observations, defined by the sum of the squares of deviations scores of each value divided by the number of degrees of freedom in the set of observations or $n - 1$.

Standard deviation

- The most widely used measure of dispersion of a frequency distribution
- It is equal to the positive square root of the variance.
- Whereas the mean tells where the group of values are centered, the standard deviation is a summary of how widely dispersed the values are around the center.

$$s = \sqrt{\frac{\sum(X - \overline{X})^2}{n - 1}}$$

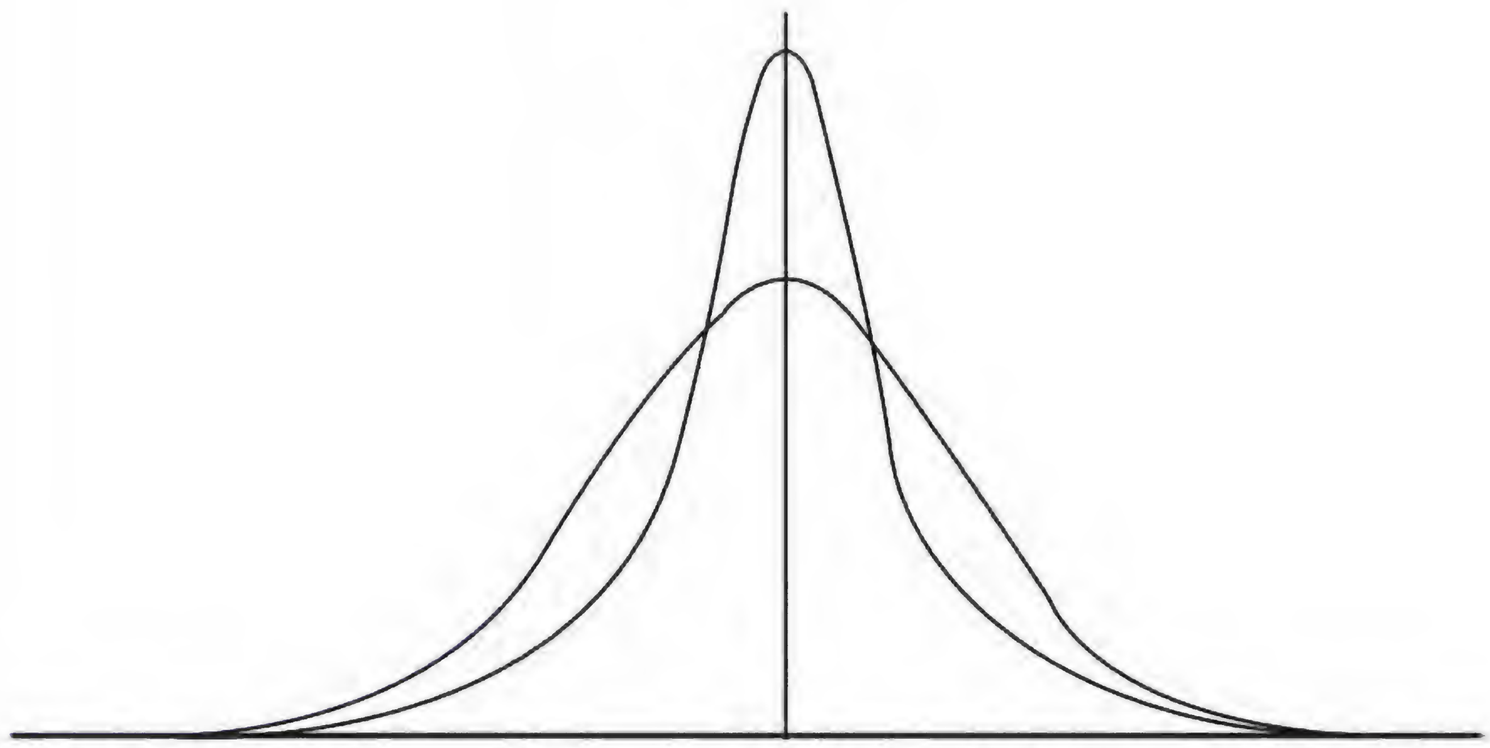


Figure II-2-4. Comparison of Two Normal Curves with the Same Means, but Different Standard Deviations

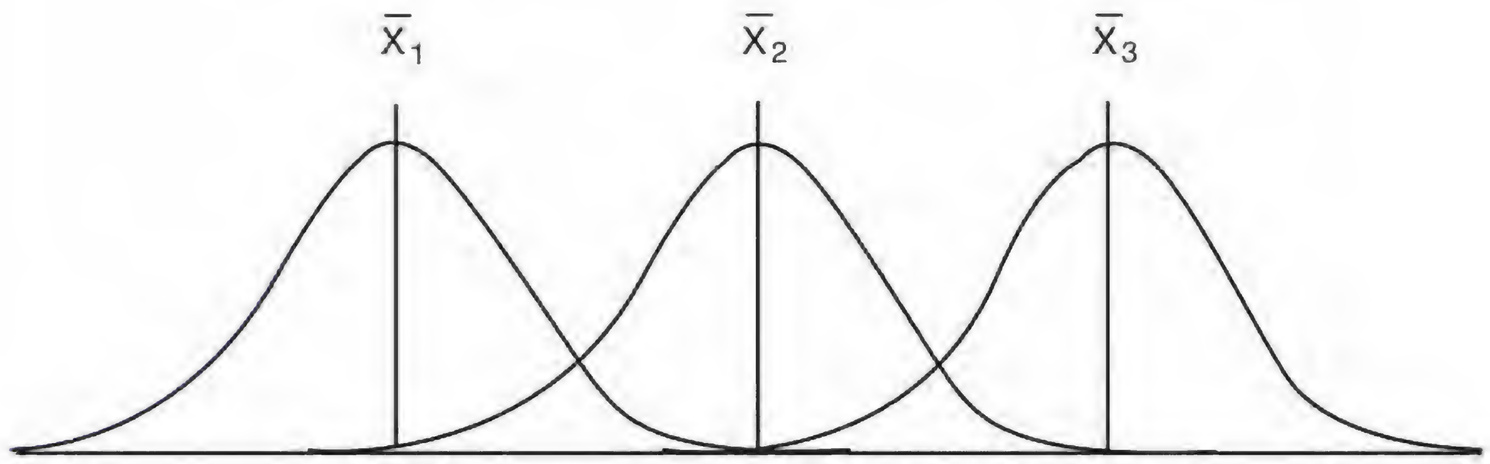
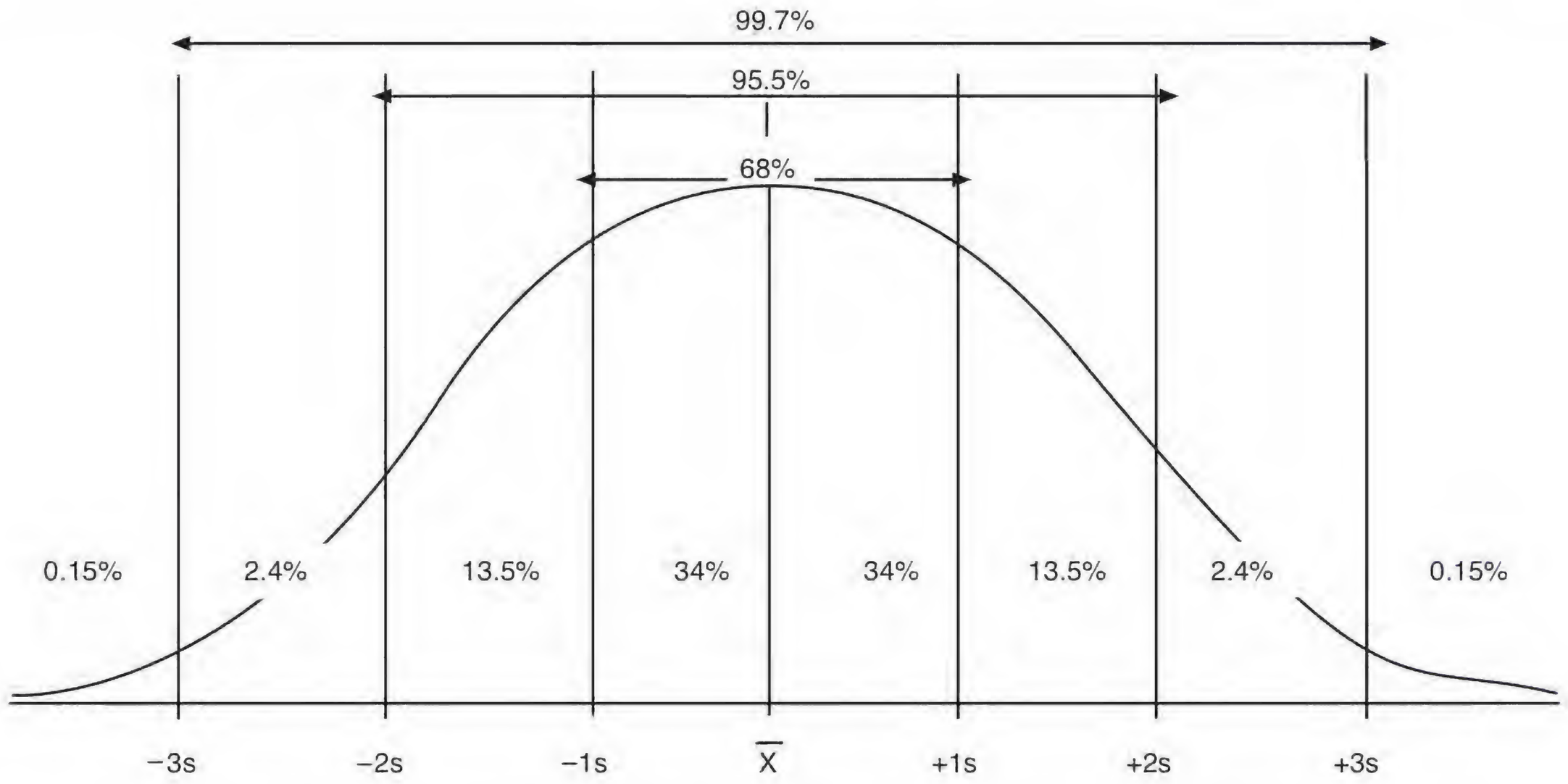


Figure II-2-5. Comparison of Three Normal Curves with the Same Standard Deviations, but Different Means



Note: Percentages are rounded so they are easier to memorize. Total area under the curve is 100%.

Figure II-2-6. Percentage of Cases Within One, Two, and Three Standard Deviations of the Mean in a Normal Distribution

The standard deviation (s or sd) is stated in score units. The normal curve has the property that within one standard deviation a certain proportion of the cases is included. The property is as follows: Between the mean and the value of one standard deviation from the mean in either direction there will be 34% of the cases; there will be 68% of the cases between the score at 1s above and 1s below the mean. Within two standard deviations of the mean are 95.5% of the cases. Between 1s and 2s from the mean in either direction, there will be 13.5% of the cases, or 27% for both. Within 3s of the mean are 99.7% of the cases. And between 2s and 3s from the mean there will be almost 2.5% of the cases, 4.7% for the two extremes together. There will be a few cases, of course, 0.3%, beyond 3s from the mean both above and below the mean. You must know these figures. For example: What percentage of the cases are below 2s below the mean? (2.5%)

Students will *not* be asked to calculate a standard deviation or a variance on the exam, but students need to know what they are and how they relate to the normal curve.

INFERENTIAL STATISTICS

Generalizations from a Sample to the Population as a Whole

The purpose of inferential statistics is to designate *how likely it is that a given finding is simply the result of chance*. Inferential statistics would not be necessary if investigators studied all members of a population. However, because we can rarely observe and study entire populations, we try to select samples that are representative of the entire population so that we can *generalize the results from the sample to the population.*

Inferential statistics focuses on drawing conclusions about an entire population (i.e., parameter) based on information in a sample.

Confidence Intervals

Confidence intervals are a way of admitting that any measurement from a sample is only an *estimate* of the population. Although the estimate given from the sample is likely to be close, the true values for the population may be above or below the sample values. A confidence interval *specifies how far above or below a sample-based value the population value lies* within a given range, from a possible high to a possible low. The true mean, therefore, is most likely to be somewhere within the specified range.

Confidence Interval of the Mean

The confidence interval contains two parts: *1)* An estimate of the quality of the sample for the estimate, known as the *standard error of the mean*; and *2)* the degree of confidence provided by the interval specified, known as the standard or Z-score. The confidence interval of the mean can be calculated by:

Mean ± appropriate Z-score × standard error of the mean = $\overline{X} \pm Z\ (S/\sqrt{N})$

- Increasing sample size will narrow the confidence interval.

Standard error of the mean is the standard deviation divided by the square root of the sample size. It demonstrates the sample mean deviation from the true population mean.

- If the standard deviation is larger, the chance of error in the estimate is greater.
- If the sample size is larger, the chance of error in the estimate is less.

The Z-score or standard score is a score from a normal distribution with a mean of 0 and a standard deviation of 1. Any distribution can be converted into a Z-score distribution using the formula:

$$Z = (X - \overline{X})/S \quad \text{or} \quad Z = \text{Sample mean} - \text{population mean}/\text{Standard deviation}$$

- The Z-score distribution is easy to use for calculations because it has simple values. All points in a Z-score distribution are *represented in standard deviation units.*
- Positive scores are above the mean; negative scores are below the mean. Therefore, a Z-score of +2.0 is exactly two standard deviations above the mean; a Z-score of –1.5 is exactly 1.5 standard deviations below the mean.

Z-scores are used in computing confidence intervals to set the level of confidence. Recall that in a normal distribution, 95.5% of the cases are within two standard deviations (2s) of the mean. To get 95% confidence and 99% confidence, all we need to know is what symmetric Z-score to use to contain exactly 95% and 99% of the cases.

- For 95% confidence = 1.96; for calculation purposes, use Z-score of 2.0.
- For 99% confidence = 2.58; for calculation purposes, use Z-score of 2.5.
- Note that a 99% confidence interval will be wider than a 95% interval.

Confidence Intervals for Relative Risk and Odds Ratios

If the given confidence interval contains 1.0, then there is no statistically significant effect of exposure. Example:

Table II-2-2

Relative Risk	95% Confidence Interval	Interpretation
1.57	(1.12–2.25)	Statistically significant (increased risk)
1.65	(0.89–2.34)	Not statistically significant (risk is the same)
0.76	(0.56–0.93)	Statistically significant (decreased risk)

Hypothesis Testing

A hypothesis is a statement that postulates a difference between 2 groups. Statistics are used to evaluate the possibility that this difference occurred by chance.

- **Null hypothesis** says that the *findings are the result of chance or random factors.* If you want to show that a drug works, the null hypothesis will be that the drug does *not* work.
  - One-tailed, i.e., directional or "one-sided," such that one group is either greater than, or less than, the other. For example, Group A is not < Group B, or Group A is not > Group B.
  - Two-tailed, i.e., nondirectional or "two-sided," such that two groups are not the same. For example, Group A = Group B
- **Alternative hypothesis** says what is left after defining the null hypothesis. In this example, the drug actually *does* work.

Significance Testing

To test your hypothesis, you would draw a random sample from a population (e.g., men with hypertension) and make an inference. But before you sample, you set a significance level, alpha, which is the risk of error you are willing to tolerate. Customarily, the level of significance is set at 0.05 and the risk is associated with the rejection of the null hypothesis, even though it is true (e.g., type I error).

Interpretation

p-Value

The p-value and alpha level are very similar, usually set at 0.05, and both symbolize significance. They are only slightly different in that the alpha level represents risk and is independent of data, whereas p-value measures the strength (i.e., significance) of the data against the null hypothesis.

A *p*-value is for interpreting output from a statistical test; focus on the *p*-value. The term refers to two things. In its first sense, the *p*-value is a standard against which we compare our results. In the second sense, the *p*-value is a result of computation.

The computed p-value is compared with the p-value criterion to test statistical significance. If the computed value is less than the criterion, we have achieved statistical significance. In general, the smaller the *p* the better.

The *p*-value criterion is traditionally set at $p \leq 0.05$. (Assume that these are the criteria if no other value is explicitly specified.) Using this standard:

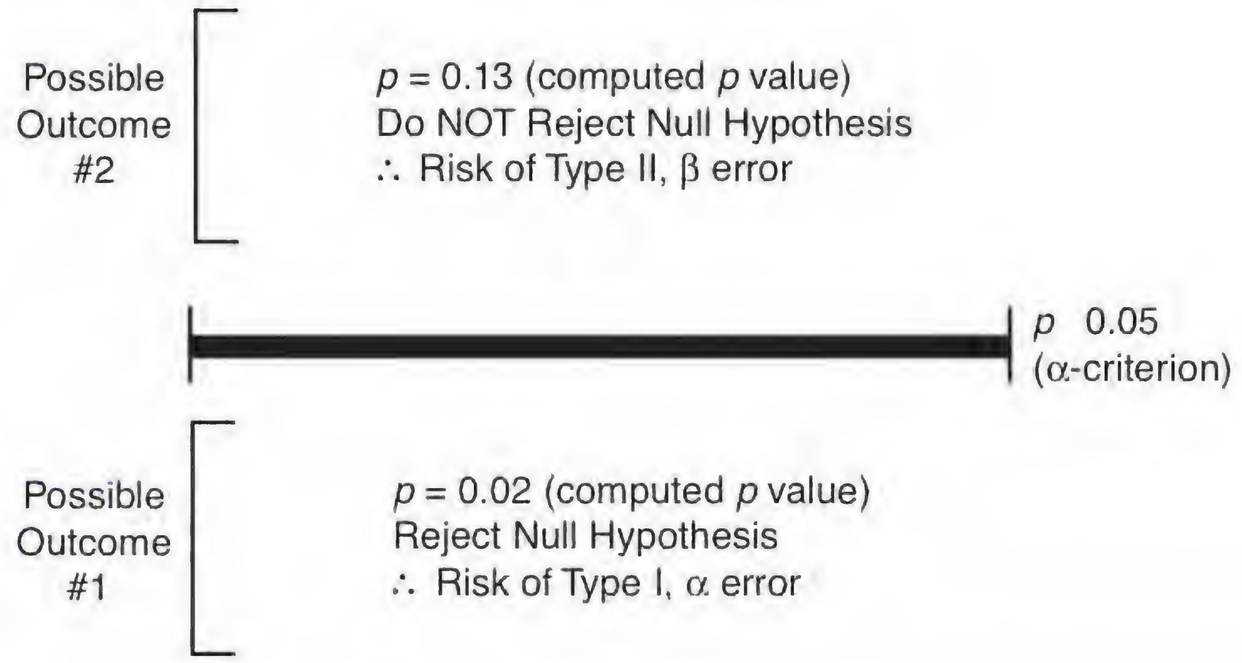


Figure II-2-7. Making Decisions Using *p*-Values

- If $p \leq 0.05$, reject the null hypothesis (reached statistical significance).
- If $p > 0.05$, do not reject the null hypothesis (has not reached statistical significance).

Therefore:

- If $p = 0.13$, fail to reject the null hypothesis, i.e., decide that the drug does not work.
- If $p = 0.02$, reject the null hypothesis, i.e., decide that the drug works.

Types of errors

Just because we reject the null hypothesis, we are not certain that we are correct. For some reason, the results given by the sample may be inconsistent with the full population. If this is true, any decision we make on the basis of the sample could be in error. There are two possible types of errors that we could make:

Type I error (α error): *rejecting the null hypothesis when it is really true*, i.e., assuming a statistically significant effect on the basis of the sample when there is none in the population or asserting that the drug works when it doesn't. The chance of a Type I error is given by the *p*-value. If p (or α) = 0.05, then the chance of a Type I error is 5 in 100, or 1 in 20.

Type II error (β error): *failing to reject the null hypothesis when it is really false*, i.e., declaring no significant effect on the basis of the sample when there really is one in the population or asserting the drug does not work when it really does. The chance of a Type II error cannot be directly estimated from the *p*-value.

β Error can be calculated by subtracting power from 1: 1 – Power = β.

- Power is the capacity to detect a difference if there is one.
- Increasing sample size (n) increases power.

Meaning of the p-value

- Provides criterion for making decisions about the null hypothesis.
- Quantifies the chances that a decision to reject the null hypothesis will be wrong.
- Tells statistical significance, not clinical significance or likelihood of benefit.
- Generally, *p*-value is considered statistically significant if it is equal to or less than 0.05.

Limits to the p-value

The *p*-value does not tell us *1*) the chance that an individual patient will benefit, *2*) the percentage of patients who will benefit, and *3*) the degree of benefit expected for a given patient.

Types of Scales

To convert the world into numbers, we use 4 types of scales: nominal, ordinal, interval, and ratio scales.

Table II-2-3. Types of Scales in Statistics

Type of Scale	Description	Key Words	Examples
Nominal (Categorical)	Different groups	This or that or that	Gender, comparing among treatment interventions
Ordinal	Groups in sequence	Comparative quality, rank order	Olympic medals, class rank in medical school
Interval	Exact differences among groups	Quantity, mean, and standard deviation	Height, weight, blood pressure, drug dosage
Ratio	Interval + true zero point	Zero means zero	Temperature measured in degrees Kelvin

Nominal or categorical scale

A nominal scale puts people into boxes, without specifying the relationship between the boxes. Sex is a common example of a nominal scale with two groups, male and female. Anytime you can say, "It's either this or that," you are dealing with a nominal scale. Other examples: cities, drug versus control group.

Ordinal scale

Numbers can also be used to express ordinal or rank-order relations. For example, we say Ben is taller than Fred. Now we know more than just the category in which to place someone. We know something about the relationship between the categories (quality). What we do not know is how different the two categories are (quantity). Class rank in medical school and medals at the Olympics are examples of ordinal scales.

Interval scale

An interval scale uses a scale graded in equal increments. In the scale of length, we know that one inch is equal to any other inch. Interval scales allow us to say not only that two things are different, but by how much. If a measurement has a mean and a standard deviation, treat it as an interval scale. It is sometimes called a "numeric scale."

Ratio scale

The best measure is the ratio scale. This scale orders things and contains equal intervals, like the previous two scales, but it also has one additional quality: *a true zero point*. In a ratio scale, zero is a floor—you can't go any lower. Measuring temperature using the Kelvin scale yields a ratio scale measurement.

SELECTING A STATISTICAL TEST

Table II-2-4. Types of Scales and Basic Statistical Tests

	Variables		
Name of Statistical Test	**Interval**	**Nominal**	**Comment**
Pearson Correlation	2	0	Is there a linear relationship?
Chi-square	0	2	Any # of groups
t-test	1	1	2 groups only
One-way ANOVA	1	1	2 or more groups
Matched pairs *t*-test	1	1	2 groups, linked data pairs, before and after
Repeated measures ANOVA	1	1	More than 2 groups, linked data

Meta-Analysis

- A statistical way of *combining the results of many studies* to produce one overall conclusion
- A mathematic literature review

Correlation Analysis (r, Ranges from –1 to +1)

- A *positive value* means that *two variables go together in the same direction*, e.g., MCAT scores have a positive correlation with medical school grades.
- A *negative value* means that the *presence of one variable is associated with the absence of another variable*, e.g., there is a negative correlation between age and quickness of reflexes.
- The further from zero, the stronger the relationship ($r = 0$).
- A zero correlation means that two variables have no linear relation to one another, e.g., height and success in medical school.

Graphing correlations using scatterplots

- A scatterplot will show points that approximate a line.
- Be able to interpret scatter plots of data: positive slope, negative slope, and which of a set of scatterplots indicates a stronger correlation.

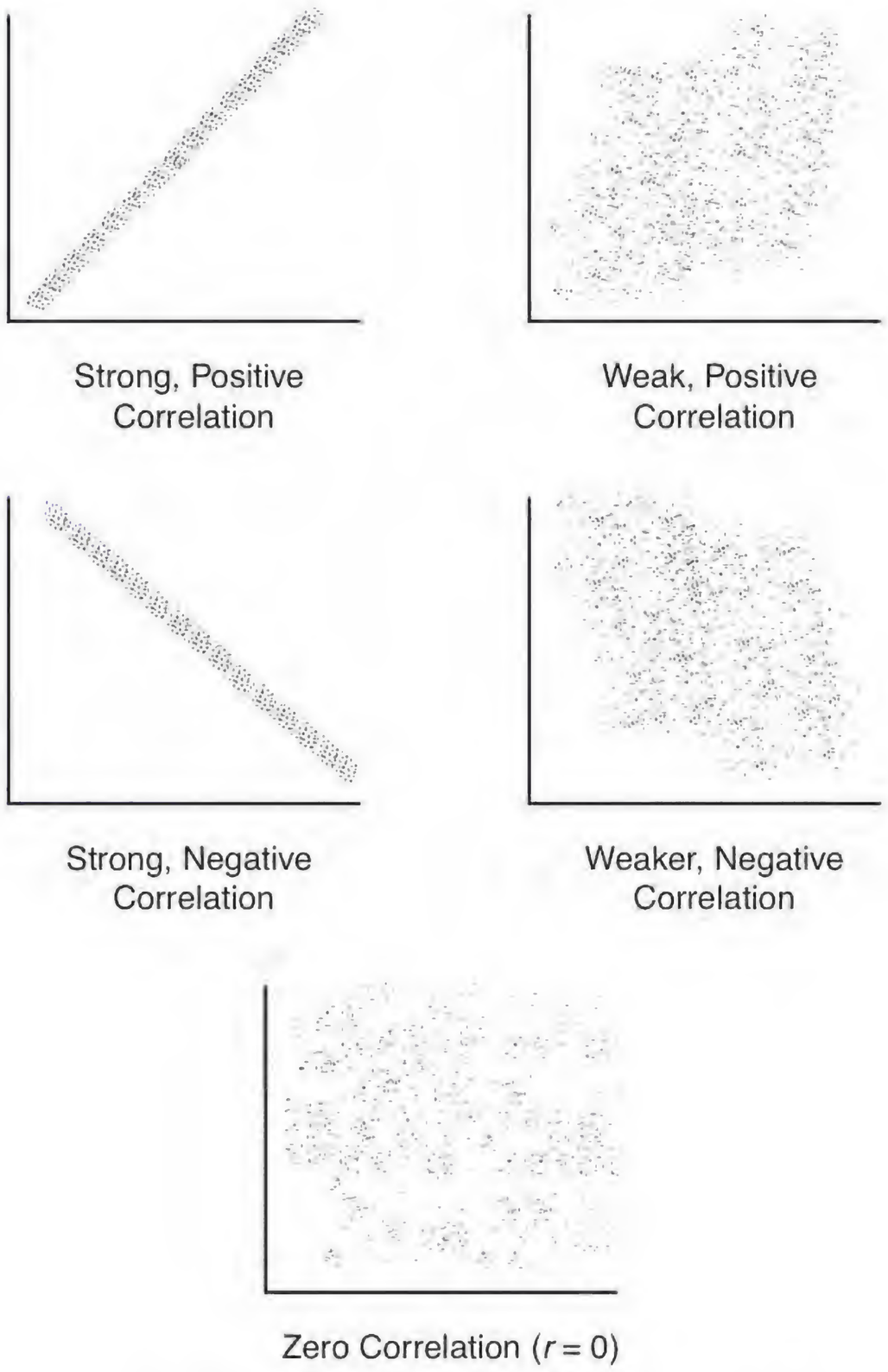


Figure II-2-8. Scatter Plots and Correlations

Note

Correlation, by itself, does not mean **causation**. A correlation coefficient indicates the **degree to which two measures are related**, not why they are related. It does not mean that one variable necessarily causes the other.

Types of correlations

There are two types of correlations. **Pearson correlation** compares two interval level variables, and the **Spearman correlation** compares two ordinal level variables.

t-Tests

The output of a *t*-test is a "*t*" statistic.

- *Comparing the means of two groups* from a single nominal variable, using means from an interval variable to see whether the groups are different

- Used for two groups only, i.e., compares two means. For example, do patients with MI who are in psychotherapy have a reduced length of convalescence compared with those who are not in therapy?
- Pooled *t*-test: regular *t*-test, assuming the variances of the two groups are the same
- Matched pairs *t*-test: if each person in one group is matched with a person in the second. Applies to before and after measures and linked data.

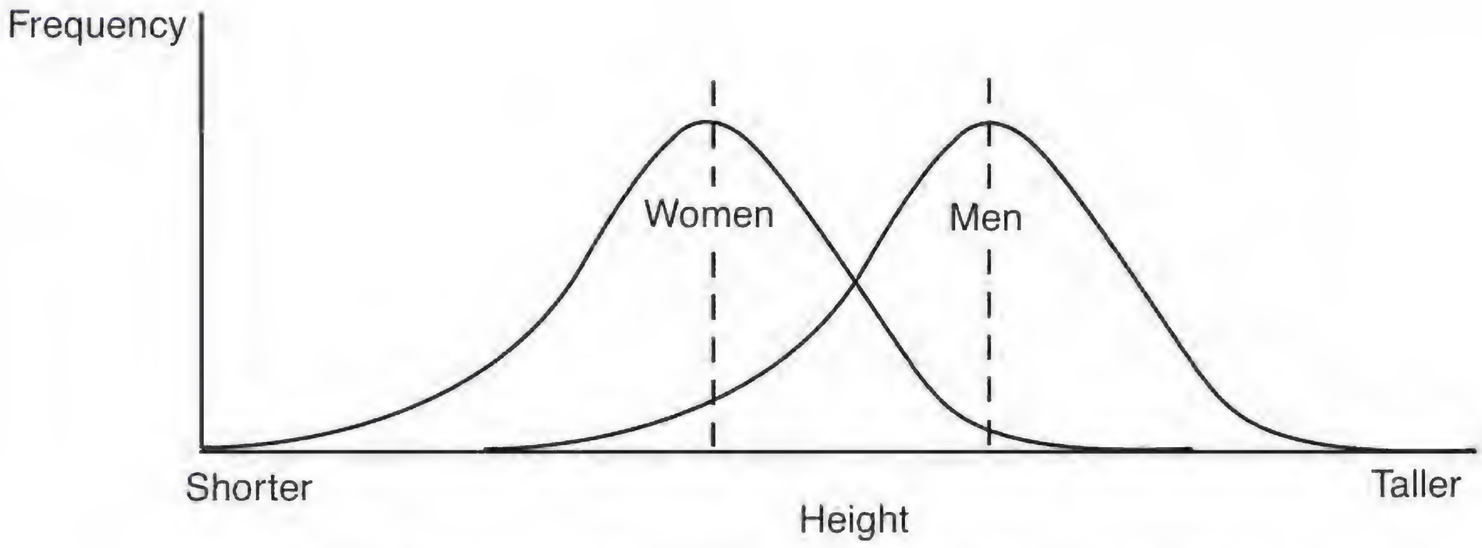


Figure II-2-9. Comparison of the Distributions of Two Groups

Analysis of Variance (ANOVA)

- Output from an ANOVA is one or more "F" statistic.
- **One-way:** *Compares means of many groups* (two or more) *of a single nominal variable* using an interval variable. Significant *p*-value means that at least two of the tested groups are different
- **Two-way:** *Compares means of groups generated by two nominal variables* using an interval variable. Can test effects of several variables at the same time.
- Repeated measures ANOVA: multiple measurements of same people over time.

Chi-Square

- Nominal data only
- Any number of groups
- Tests to see whether two nominal variables are independent, e.g., testing the efficacy of a new drug by comparing the number of recovered patients given the drug with those who are not

Table II-2-5. Chi-Square Analysis for Nominal Data

	New Drug	Placebo	Totals
Recovered	45	35	80
Not Recovered	15	25	40
Totals	60	60	120

Review Questions

1. The American Medical Association commissions a health study of a representative sample of U.S. physicians. Enrolled physicians complete detailed surveys and undergo an extensive battery of medical tests. For a number of analyses, physicians are classified by subspecialty. Although numerous physiologic measures are assessed, the following questions describe analyses of just one of these, mean fasting plasma glucose. Select the appropriate statistical test for a comparison of mean fasting plasma glucose values for representative samples of surgeons and cardiologists.

   A. *t*-test
   B. Matched pairs *t*-test
   C. One-way ANOVA
   D. Two-way ANOVA
   E. Chi-square

2. An experimenter conducts a test of a new medication compared with the current standard medication. Alpha is selected to be 0.05. At the conclusion of the trial, the sample of patients receiving the new medication shows more improvement than the comparison group on the standard medication. The *p*-value is 0.002. What will the experimenter conclude?

   A. Do not reject the null hypothesis.
   B. The new medication has more clinical benefits than the standard medication.
   C. The likelihood that a type I error has actually been committed is less than the maximum risk the experimenter was willing to accept.
   D. The result is not significant.
   E. A type II error has been committed.

3. Body mass index (BMI) is found to correlate to the following physiologic measures. For which measure is the correlation the strongest?

   A. Physical activity ($r = -0.56$)
   B. Percentage of calories from complex carbohydrates ($r = -0.32$)
   C. Systolic blood pressure ($r = +0.43$)
   D. Triglycerides ($r = +0.37$)
   E. LDL cholesterol ($r = +0.49$)

4. A new treatment for elevated cholesterol is piloted on a sample of 100 men, ages 45–59 with total serum cholesterol in the range of 260–299 mg/dL at entry. Following 3 months on the medication, the mean cholesterol for the treatment group was 250 mg/dL with a standard deviation of 20 mg/dL. What is the 95% confidence interval on the mean for this study?

   A. 210–290 mg/dL
   B. 230–270 mg/dL
   C. 246–254 mg/dL
   D. 248–252 mg/dL
   E. 249–251 mg/dL

(*Continued*)

Review Questions (*continued*)

5. The Wechsler Adult Intelligence Scale–Revised (WAIS-R) is a standardized IQ test with a mean of 100 and a standard deviation of 15. A person with an IQ of 115 is at what percentile of IQ?

   A. 50th
   B. 68th
   C. 84th
   D. 95th
   E. 99th

6. From a published article describing the results of the study presented above, the following data table is abstracted. This table presents the relative risks (RR) of clinical diabetes for each of the categories of fat intake relative to the baseline category of <20%. Interpret the study findings from the tabular data.

	% of Calories from Fat	RR for Diabetes	95% Confidence Interval
Baseline	<20	1	—
Level 2	20–34	1.3	0.8–1.8
Level 3	35–49	2	1.6–2.6
Level 4	>50	3	2.7–3.3

   A. Levels 2, 3, and 4 have significantly elevated risks for diabetes relative to baseline.
   B. Levels 2 and 3 are significantly different from each other.
   C. Levels 3 and 4 are significantly different from baseline and risk elevating.
   D. Levels 3 and 4 are not significantly different from each other.
   E. RR for levels 2, 3, and 4 are numerically different but not significantly different from baseline.

1. Answer: A.
2. Answer: C.
3. Answer: A.
4. Answer: C.
5. Answer: C.
6. Answer: C.

Ethics 3

ETHICAL AND LEGAL ISSUES: IMPORTANT COURT CASES

Karen Ann Quinlan: Substituted Judgment Standard

In the Quinlan case, Karen Ann was in a persistent vegetative state, being kept alive only by life support. Karen's father asked to have her life support terminated according to his understanding of what Karen Ann would want. The court found that "if Karen herself were miraculously lucid for an interval...and perceptive of her irreversible condition, she could effectively decide upon discontinuance of the life support apparatus, even if it meant the prospect of natural death."

The court therefore allowed termination of life support, not because the father asked, but because it held that the father's request was most likely the expression of Karen Ann's own wishes.

Substituted judgment begins with the premise that decisions belong to the competent patient by virtue of the rights of autonomy and privacy. In this case, however, the patient is unable to decide, and a decision-maker who is the best representative of the patient's wishes must be substituted. In legal terms, the patient has the right to decide but is incompetent to do so. Therefore, the decision is made for the patient on the basis of the best estimate of his or her subjective wishes.

Note: The key here is not who is the closest next of kin, but who is most likely to represent the patient's own wishes.

Brother Fox (Eichner versus Dillon): Best Interest Standard

The New York Court of Appeals, in its decision of Eichner versus Dillon, held that trying to determine what a never-competent patient would have decided is practically impossible. Obviously, it is difficult to ascertain the actual (subjective) wishes of incompetent patients.

Therefore, if the patient has always been incompetent, or no one knows the patient well enough to render substituted judgment, the use of substituted judgment standard is questionable, at best.

Under these circumstances, decisions are made for the patient using the best interest standard. The object of the standard is to decide what a hypothetical "reasonable person" would decide to do after weighing the benefits and burdens of each course of action.

Note: The issue here of who makes the decision is less important. All persons applying the best interests standard should come to the same conclusions.

Infant Doe: Foregoing Lifesaving Surgery, Parents Withholding Treatment

As a general rule, parents cannot withhold life- or limb-saving treatment from their children. Yet, in this exceptional case they did.

Baby Boy Doe was born with Down syndrome (trisomy 21) and with a tracheoesophageal fistula. The infant's parents were informed that surgery to correct his fistula would have "an even chance of success." Left untreated, the fistula would soon lead to the infant's death from starvation or pneumonia. The parents, who also had two healthy children, chose to withhold food and treatment and "let nature take its course."

Court action to remove the infant from his parents' custody (and permit the surgery) was sought by the county prosecutor. The court denied such action, and the Indiana Supreme Court declined to review the lower court's ruling. Infant Doe died at 6 days of age, as Indiana authorities were seeking intervention from the U.S. Supreme Court.

Note: This case is simply an application of the best interest standard. The court agreed with the parents that the burdens of treatment far outweighed any expected benefits.

Roe versus Wade (1973): The Patient Decides

Known to most people as the "abortion-legalizing decision," the importance of this case is not limited to its impact on abortion.

Faced with a conflict between the rights of the mother versus the rights of the putative unborn child, the court held that in the first trimester, the mother's rights are certainly paramount, and that individual states may, if they wish, have the mother's rights remain paramount for the full term of the pregnancy.

Because the mother gets to decide, even in the face of threats to the fetus, by extension, all patients get to decide about their own bodies and the healthcare they receive. In the United States, the locus for decision-making about health care resides with the patient, not the physician.

Note: The courts have held that a pregnant woman has the right to refuse care (e.g., blood transfusions) even if it places her unborn child at risk.

Tarasoff Decision: Duty to Warn and Duty to Protect

A student visiting a counselor at a counseling center in California states that he is going to kill someone. When he leaves, the counselor is concerned enough to call the police but takes no further action. The student subsequently kills the person he threatened. The court found the counselor and the center liable because they did not go far enough to warn and protect the potential victim.

The counselor should have called the police and then should also have tried in every way possible to notify the potential victim of the potential danger.

In similar situations, first try to detain the person making the threat. Next, call the police, and, finally, notify and warn the potential victim. All three actions should be taken or at least attempted.

ETHICAL AND LEGAL ISSUES: RULES FOR THE EXAM

This section lays out a set of rules that constitute the general consensus of legal opinion. Apply these rules to individual situations as they arise.

Rule #1: Competent patients have the right to refuse medical treatment.

Incompetent patients have the same rights, but these rights must be exercised differently (via a surrogate).

Patients have an almost absolute right to refuse. Patients have almost absolute control over their own bodies. The sicker the patient, the lesser the chance of recovery; thus, the greater the right to refuse treatment.

Rule #2: Feeding tube is a medical treatment and can be withdrawn at the patient's request.

- Very controversial. See Cruzan case, 1990.
- A competent person can refuse even lifesaving hydration and nutrition.

Rule #3: Assume that the patient is competent unless clear behavioral evidence indicates otherwise.

- Competence is a legal, not a medical issue.
- A diagnosis, by itself, tells you little about a patient's competence.
- Clear behavioral evidence would be:
  - Patient is grossly psychotic and dysfunctional.
  - Patient's physical or mental state prevents simple communication.

If you are unsure, assume the patient is competent. The patient does not have to prove to you that he is competent. You have to have clear evidence to assume that he is not.

Rule #4: Special rules apply with children.

- Children younger than age 18 years are minors and are legally incompetent.
- Exceptions are emancipated minors.
  - If older than 13 years and taking care self, i.e., living alone, treat as an adult.
  - Marriage makes a child emancipated, as does serving in the military.
  - Pregnancy or having a child, in most cases, does not.
- Partial emancipation
  - Many states have special ages of consent; generally, age 14 and older.
  - For certain issues only: *1*) substance drug treatment, *2*) prenatal care, *3*) sexually transmitted disease treatment, and *4*) birth control.

Rule #5: Parents cannot withhold life- or limb-saving treatment from their children.

- If parents refuse permission to treat child:
  - If immediate emergency, go ahead and treat.
  - If not immediate, but still critical (e.g., juvenile diabetes), generally the child is declared a ward of the court and the court grants permission.
  - If not life- or limb-threatening (e.g., child needs minor stitches), listen to the parents.
- Note: The child cannot give permission. A child's refusal of treatment is irrelevant.

Rule #6: Avoid going to court. Decision-making should occur in clinical setting if possible, without going to court.

- Consider going to court only if (often resolved without court action)
  - There is intractable disagreement about a patient's competence, who should be the surrogate, or make the decision on life support.
  - You perceive a serious conflict of interest between surrogate and patient's interests.
- Court approval of decision to terminate life support is, therefore, rarely required.

Rule #7: When surrogates make decisions for a patient, they should use the following criteria and in this order:

1. Subjective standard
   - Actual intent, advance directive
   - What did the patient say in the past?

2. Substituted judgment
   - Who best represents the patient?
   - What would patient say if he or she could?

3. Best interests standard
   - Burdens versus benefits
   - Interests of patient, not preferences of the decision-maker

Rule #8: If patient is incompetent, physician may rely on advance directives.

- Advance directives can be oral.
- Living will: written document expressing wishes
  - Care facilities must provide information at time of admission.
  - It is the responsibility of the institution, not the physician.
- Health power of attorney: designating the surrogate decision-maker
  - "Speaks with the patient's voice"
  - Beats all other decision rules

Rule #9: Do nothing to actively assist the patient to die sooner.

- Active euthanasia and assisted suicide are on difficult ground.
  - Passive, i.e., allowing to die → acceptable
  - Active, i.e., killing → unacceptable
- On the other hand, do all you can to reduce the patient's suffering (e.g., giving pain medication).

Rule #10: Patients decide when treatment stops, but physicians declare death.

- What if there are no more treatment options (the patient is cortically dead), and the family insists on treatment? If there are no options, there is nothing the physician can do; treatment must stop.
- What if the physician thinks continued treatment is futile (the patient has shown no improvement), but the surrogate insists on continued treatment? Of course, the treatment should continue. See the Wangley case, 1989.

Rule #11: Never abandon a patient.

- Lack of financial resources or lack of results are never reasons to stop treatment of a patient.
- An annoying or difficult patient is still your patient.

Rule #12: Always obtain informed consent.

- Full informed consent requires that the patient has received and understood five pieces of information:
  - Nature of procedure
  - Purpose or rationale
  - Benefits
  - Risks
  - Availability of alternatives
- Four exceptions to informed consent:
  - Emergency
  - Waiver by patient
  - Patient is incompetent
  - Therapeutic privilege (unconscious, confused, physician deprives patient of autonomy in interest of health)
- Gag clauses that prohibit a physician from discussing treatment options that are not approved violate informed consent and are illegal.
- Consent can be oral.
- A signed paper the patient has not read or does not understand does *not* constitute informed consent.
- Written consent can be revoked, orally, at any time.

Rule #13: For the purposes of the USMLE, issues governed by laws that vary widely across states cannot be tested.

This includes elective abortions (minor and spousal rights differ by locality) and legal age for drinking alcohol (vary by state).

Rule #14: Good Samaritan Laws limit liability when physicians help in nonmedical settings.

- Not required to stop to help.
- If help offered, shielded from liability provided:
  - Actions are within physician's competence.
  - Only accepted procedures are performed.
  - Physician remains at scene after starting therapy until relieved by competent personnel.
  - No compensation changes hands.

Rule #15: Confidentiality is absolute.

- Physicians cannot tell anyone anything about their patient without the patient's permission.
- Getting a consultation is permitted because the consultant is bound by confidentiality, too. However, watch the location of the consultation. Be careful not to be overheard (e.g., in elevator or cafeteria).
- If you receive a court subpoena, show up in court, but do not divulge information about your patient.
- If patient is a threat to self or other, the physician *must* break confidentiality.
  - Duty to warn and duty to protect (Tarasoff case)
  - Suicide, homicide, and abuse are obvious threats.
  - Infectious disease should generally be treated as a threat, but be careful. Here, the issue is usually getting the patient to work with you to tell the person who is at risk.
  - In the case of an STD, the issue is not really whether to inform a sexual partner, but how they should be told. Best advice: Have patient and partner come to your office.

Rule #16: Patients should be given the chance to state DNR (Do Not Resuscitate) orders, and physicians should follow them.

- DNR refers only to cardiopulmonary resuscitation.
- Continue with ongoing treatments.
- Most physicians are unaware of DNR orders.
- DNR decisions are made by the patient or surrogate.
- DNR discussions should occur early in treatment.

Rule #17: Committed mentally ill patients retain their rights.

- Committed mentally ill adults legally are entitled to the following:
  - They must have treatment available.
  - They can refuse treatment.
  - They can command a jury trial to determine "sanity."
- They lose only the civil liberty to come and go.
- They retain their competence for conducting business transactions, marriage, divorce, voting, and driving.
- The words "sanity" and "competence" are legal, not psychiatric, terms. They refer to prediction of dangerousness, and medicopsychologic studies show that health care professionals cannot reliably and validly predict such dangerousness.

Rule #18: Detain patients to protect themselves or others.

- Emergency detention can be effected by a physician and/or a law enforcement person for 48 hours, pending a hearing.
- A physician can detain; only a judge can commit.
- With children, special rules exist. Children can be committed only if:
  - They are in imminent danger to self and/or others
  - They are unable to care for their own daily needs
  - The parents have absolutely no control over the child, and the child is in danger (e.g., fire setter), but not because the parents are unwilling to discipline a child.

Rule #19: Remove from the patient contact health care professionals who pose risk to patients.

- Types of risks
  - Infectious disease (e.g., TB)
  - Substance abuse
  - Depression (or other psychologic issues)
  - Incompetence
- Actions
  - Insist that they take time off.
  - Contact their supervisors if necessary.
  - Get them to treatment.
  - The patient, not professional solidarity, comes first.

Rule #20: Focus on what is the best ethical conduct, not simply the letter of the law.

The best answers are those that are both legal and ethical. Increasingly, right answers are determined by selecting the right process, not merely the right goals. The exam questions are testing your capacity to select the proper *means*, not just recognize the proper *ends*.

PHYSICIAN–PATIENT RELATIONSHIP: RULES FOR THE EXAM

Rule #1: Patient is number one: always place the interests of the patient first.

- Choose the patient's comfort and safety over anyone else's.
- The goal is to serve the patient, not to worry about legal protection for the physician.

Rule #2: Always respond to the patient.

- Answer any question that is asked.
- Respond to the emotional, as well as the factual, content of questions.

Rule #3: Tell the patient everything, even if he or she does not ask.

- Do not force a patient to hear bad news if the patient does not want it at that moment, but do try to discuss it with him or her as soon as possible.
- Information should flow through the patient to the family, not the reverse.
- If you have only partial information, say that it is partial, and tell what you know.

Rule #4: Work on developing a rapport on an ongoing basis. Always seek a good, long-term relationship with the patient.

- Make eye contact.
- Defined touch: Tell him or her what you are doing.
- Talk to patient, not colleagues: Patient is always the focus.
- Arrange seating for comfortable, close communication.
- Shy away from large desks and tables.
- If at all possible, both patient and physician should both be sitting.

Rule #5: Listen, reflect, encourage.

- Getting the patient to talk is generally better than having the physician talk.
- Take time to listen to the patient before you, even if other patients or colleagues are waiting.

Rule #6: Negotiate rather than order.

- Treatment choices are the result of agreement, not commands by the physician.
- Remember, the patient makes medical decisions from the choices provided by the physician.

Rule #7: Notice and respond to new information.

- Change plans and goals as events change. New information should cause you to stop and reassess.
- Don't get carried away by inertia. *How* you reach your goal may shift with new information, even if the goal itself stays the same.
- When new people enter the picture, you must adjust and deal with them.

Rule #8: Admit to the patient when you make a mistake.

- Take responsibility. Don't blame it on the nursing staff or on a medical student.
- Admit the mistake even if it was corrected and the patient is fine.

Rule #9: Never "pass off" your patient to someone else.

- Refer to psychiatrist or other specialist when beyond your expertise (but usually not the case).
- Refer only for ophthalmology or related subspecialties.
- Provide instruction in aspects of care, e.g., nutrition, use of medications.

Rule #10: Express empathy, then give control: "I'm sorry, what would you like to do?"

- Important when faced with a patient who is grieving or is angry
- Important when faced with angry or upset family members

Rule #11: Agree on problem before moving to solution.

- Tell the patient your perceptions and conclusions about the condition before moving to treatment recommendations.
- Informed consent requires the patient to fully understand what is wrong.
- Offering a correct treatment before the patient understands his or her condition is wrong.

Rule # 12: Be sure you understand what the patient is talking about before intervening.

- Seek information before acting.
- When presented with a problem, get some details before offering a solution.
- Begin with open-ended questions, them move to closed-ended questions.

Rule # 13: Patients do not get to select inappropriate treatments.

- Patients select treatments, but only from presented, appropriate choices.
- If a patient asks for an inappropriate medication that he/she heard advertised, explain why it is not indicated and suggest an alternative.

Rule#14: Be sure who your patient is.

- Is it the injured child or the mother who brings him in? (The child)
- Is it your long-term patient, who is now in a coma, or her husband? (The patient)

Rule # 15: Never lie.

- Not to patients, their families, or insurance companies
- Do not deceive to protect a colleague.

Rule#16: Accept the health beliefs of patients.

- Be accepting of benign folk medicine practices. Expect them. Diagnoses need to be explained in the way patients can understand, even if not technically precise.
- Be careful about having young family members translate for elderly patients.

Rule #17: Accept patients' religious beliefs and participate if possible.

- Your goal is to make the patient comfortable. Religion is a source of comfort to many.
- A growing body of research suggests that patients who pray and are prayed for have better outcomes.
- Ask about a patient's religions beliefs if you are not sure (but not as a prelude to passing off to the chaplain!).

Rule #18: Anything that increases communication is good.

- Take the time to talk with patients, even if others are waiting.
- Ask "why?"
- Seek information about the patient beyond the disease.

Rule #19: Be an advocate for the patient.

- Work to get the patient what he or she needs.
- Never refuse to treat a patient because he or she cannot pay.

Rule #20: The key is not so much what you do, but how you do it.

- The right choices are those that are humane and sensitive and put the interests of the patient first.
- Treat family members with courtesy and tact, but the wishes and interests of the patient come first.
- Theme: The key is not what physicians *actually* do, but what the most ideal physician *should* do.

Miscellaneous Physician–Patient Relationship Topics

Types of questions and statements

- *Open-ended question:* allows broad range for answer.
- *Closed-ended question:* limits answer, e.g., yes or no.
- *Leading question:* suggests or indicates preferred answer.
- *Confrontation:* brings to the patient's attention some aspect of appearance or demeanor.
- *Facilitation:* gets the patient to continue a thought, talk more; "Tell me about that…"
- *Redirection:* puts question back to the patient.
- *Direct question:* seeks information directly. Avoid judgmental terms.

Components of the sick role

- Exempt from normal responsibilities
- Not to blame for illness
- Obligated to get well
- Obligated to seek competent help

Note: The sick role generally does not apply to chronic illness or very minor illnesses.

The significance of a good relationship with the patient

- The key is not the amount of time spent with a patient, but what is done during that time.
- Lack of rapport is the chief reason that terminally ill patients reject medical advice, or why patients change physicians or miss appointments.
- Failure of patient to cooperate, or even to keep appointments, should be seen as the result of physician insensitivity or seeming indifference.

Adherence

See Figure II-3-1.

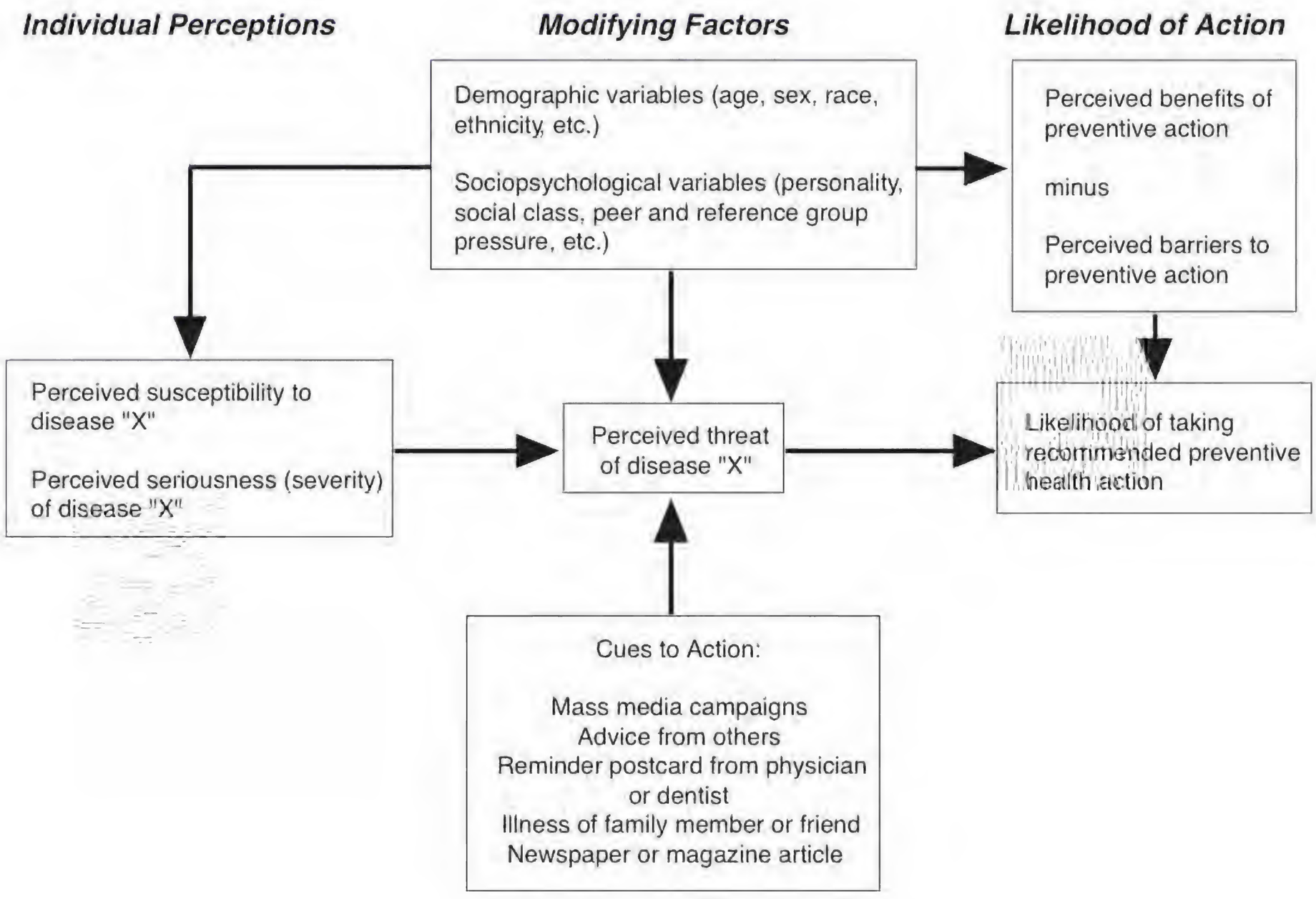


Figure II-3-1. The Health Belief Model

Table II-3-1. Why Some Patients Don't Adhere to Treatment

Patient variables	Type and severity of psychiatric diagnosis (in particular, diagnosis of schizophrenia, bipolar affective disorder, paranoia, personality disorder) Sensory disabilities Forgetfulness Lack of understanding Inappropriate or conflicting health benefits Competing sociocultural and ethnic folk concepts of disease and treatment Implicit model of illness Apathy and pessimism Failure to recognize that one is ill or in need of medication Previous or present history of nonadherence with other regimens Health beliefs (e.g., misconceptions about disorder, no understanding of prophylaxis, belief that medicine is necessary only in acute illness) Dissatisfaction with practitioner or treatment
Characteristics of individual's social situation	Lack of social supports Family instability or disharmony Parent's expectations and attitudes toward treatment Residential instability Environment that supports nonadherent behavior Competing or conflicting demands or other pressing demands (poverty, unemployment) Lack of resources (transportation, money, time)
Disease or disorder variables	Chronic condition with lack of overt symptomatology Stability of symptoms Disorder-related characteristics (e.g., confusion, visual distortion, psychological reactions)
Treatment variables	Characteristics of treatment setting Absence of continuity of care Long waiting time Long elapsed time between referral and actual appointment (more than 8 days) Timing of referral Absence of individual appointment times Lack of cohesiveness of treatment delivery system Inconvenience associated with operation of clinics (e.g., inefficiency, unfriendly personnel) Poor reputation of treatment facility Inadequate supervision by professionals Characteristics of treatment recommendations Complexity of treatment regimen (e.g., multiple medication) Long duration of treatment regimen Degree of behavioral change (e.g., interferes with personal behavior and depends upon alteration of one's life style) Inconvenience (e.g., location of clinic, poor transportation) Expense Characteristics of medicine (e.g., color of pill, drug size, preparation form—i.e., capsule or tablet) Inadequate labels Awkward container design Failure of parents to supervise drug administration Medication side effects or side effects associated with altered behavior (e.g., sedation, extrapyramidal involvement)
Relationship variables: patient–health care provider (HCP) interaction	Inadequate communication Poor rapport Attitudinal and behavioral (verbal and nonverbal) faults on the part of either HCP or patient Failure of HCP to elicit negative feedback about problems stemming from treatment regimen Patient's dissatisfaction Inadequate supervision

Research has shown that physicians cannot tell which of their patients do and do not adhere. They probably assume that more of their patients are adhering than actually are. When a patient does fail to adhere, the physician often blames the patient.

Nonadherence may represent any of the following:

- Patient dissatisfaction with physician—*misunderstanding of instructions*
- Interference by family
- Inability to afford medications

Adherence also increases if the physician is familiar with the patient's health beliefs, even if they are different from the physician's.

It is not enough for a physician to provide information and treatment and leave adherence to the patient. Rather, the physician must present information in ways that will optimize patient adherence:

- Attending to the amount of information and its complexity
- The patient's affective state
- Explaining why the particular treatment is being recommended
- Stressing the threat that nonadherence poses to patient's health
- Stressing the effectiveness of the prescribed regimen

Nonverbal communication

The face is the primary means of communicating emotional states:

- Fear and sadness are communicated almost exclusively through the eyes.
- Surprise, anger, and happiness largely through the lower face.

Vocal intonation is the second most important system for expressive communication.

Six basic emotions: happiness, anger, sadness, surprise, fear, and disgust. The facial expressions associated with these emotional states are easily recognized and are identical all over the world.

Touch can be a powerful tool in healing. It can be reassuring and can create positive expectations; it can be disturbing if it violates norms. Touching can communicate intimacy or power.

Review Questions

Ethical Legal Rules for Exam Questions

1. Should physicians answer questions from insurance companies or employers?
2. Should physicians answer questions from the patient's family without the patient's explicit permission?
3. What information can the physician withhold from the patient?
4. What if the family requests that certain information be kept from the patient?
5. Who owns the medical record?

What should the physician do in each of these situations?

6. Patient refuses life-saving treatment on religious grounds.
7. Wife refuses to consent to emergency life-saving treatment for unconscious husband citing religious grounds.
8. Wife produces card stating unconscious husband's wish to not be treated on religious grounds.
9. Mother refuses to consent to emergency life-saving treatment for her daughter on religious grounds.
10. What if the child's life is at risk, but the risk is not immediate?
11. From whom do you get permission to treat a girl who is 17 years old?

From whom does the physician obtain consent in each of the following cases?

12. A 17-year-old girl's parents are out of the country and the girl is staying with a baby-sitter.
13. A 17-year-old girl who has been living on her own and taking care of herself.
14. A 17-year-old girl who is married.
15. A 17-year-old girl who is pregnant.
16. A 16-year-old daughter refuses medication, but her mother consents. Do you write the prescription?
17. The 16-year-old daughter consents, but the mother refuses.
18. The mother of a minor consents, but the father refuses.
19. When should the physician provide informed consent?
20. Must informed consent be written?
21. Can written consent be revoked orally?
22. Can you get informed consent from a schizophrenic man?
23. Must you get informed consent from a prisoner if the police bring in the prisoner for examination?

(*Continued*)

Review Questions (*continued*)

Physician–Patient Relationships

24. A 17-year-old boy is brought to an outpatient clinic and requires sutures to close a laceration on his left calf sustained during football practice at his prep school, a military academy where he lives full-time on campus. His parents live in another state, approximately 800 miles from the school; the doctor is unable to reach either parent by telephone. From whom does the doctor receive permission to treat the boy?

    A. The boy himself; he is an emancipated minor
    B. The Dean of Students at the prep school
    C. The boy's football coach
    D. The boy's 18-year-old teammate who accompanied him to the clinic
    E. The boy's family physician in his hometown

25. A 14-year-old girl, sitting in the passenger seat, is severely injured in a broadside collision. She has profuse internal bleeding and loses consciousness immediately. The mother, who is driving, sustains a forearm fracture but remains alert. Transported by emergency helicopter to the regional trauma center, the emergency medicine physician immediately recognizes that rapid-infusion transfusion is essential to save the girl's life. Nevertheless, the girl's mother objects on religious grounds. The physician will

    A. abide by the mother's directive and not transfuse the girl
    B. administer the transfusion immediately to save the girl's life
    C. discuss the options and alternatives with the mother to make sure that she clearly understands the consequences of declining blood transfusion
    D. ask the mother's permission to transfuse blood plasma rather than whole blood
    E. ask the mother's permission to obtain and transfuse "blood substitute" from the regional blood bank

26. A physician is favorably impressed with the effectiveness of a new aerosol medication for treatment of asthma and wishes to prescribe it for a 13-year-old girl with recurrent asthma attacks. She is eager to try the new medication. However, her mother, who accompanies her to the clinic, asks that she not receive the medication. The physician's most appropriate action would be to

    A. politely but firmly prescribe the medication in the health interests of the girl despite the protest of the mother
    B. not dispense the medication because is adherence is jeopardized by the mother's lack of support
    C. not dispense the medication because the mother has not consented to this treatment
    D. inform the mother that the child will need to be declared a ward of the state if she, the mother, does not provide consent
    E. provide a free sample inhaler and ask the girl and her mother to try it out before deciding to decline the prescription

(*Continued*)

Review Questions (*continued*)

27. A white man, estimated to be 50 years of age, was brought to the ER by the police who found him wandering in a local park on a cold December night with no clothes on and without identification. The patient is able to speak but only utters curses directed first at the police and then at the medical staff. Beyond this, the patient is calm and nonaggressive. However, he refuses all attempts to question him, refuses all medications offered, and continues to refuse to wear clothes. What action should the physician take?

    A. Commit the patient to a locked psychiatric ward for observation and treatment
    B. Declare the patient incompetent based on his manifest behavior and administer the appropriate psychiatric medications
    C. Seek the permission of the police to administer the appropriate psychiatric medications
    D. Detain the patient for observation pending a status hearing in the next few days
    E. Contact the Public Guardian to secure consent for the man's treatment

28. A young Hispanic man in the Navy visits the physician's office during regular office hours to request treatment for recently acquired gonorrhea. During the taking of standard patient history, the man reveals that he is only 16 years old that he got into the Navy just this past year by lying about his age. The young man asks the physician to treat him and asks that the doctor keep his secret. Before treating this man, the physician should

    A. obtain permission from the patient's senior officer
    B. obtain permission from the chief medical officer connected to the patient's unit
    C. obtain permission from the patient's parents because he is underage
    D. treat him only under the condition that he allow the entry of his correct age on the medical record
    E. obtain his consent then treat him as he requests

29. A 56-year-old man has been nonadherent with his hypertensive medication. When questioned in the course of his regular office visit, he reports that he feels fine and just gets so busy that he forgets to take his pills. "I know this is a serious condition," he says, "but it really doesn't look like it is a threat to me." According to the Health Belief model, what course of action by the physician is most likely to increase his adherence in the future?

    A. Have him attend a hypertension support group
    B. Ensure that he has access to a pharmacy to get his prescription filled
    C. Modify his prescription from a once a day to a three times a day dosage
    D. Tell him a story about another patient who, like him, was asymptomatic with hypertension but who has recently died
    E. Give him a pamphlet on the dangers of hypertension and ask him to talk to you after he reads it

(*Continued*)

Review Questions (*continued*)

1. Not without a release from the patient
2. No
3. Nothing, if patient may react negatively; figure out how to tell patient to mitigate negative outcome
4. Tell the patient, but first find out why they don't want the patient told
5. Health care provider, but patient must be given access or copy on request
6. Don't treat
7. Treat; no time to assess substituted judgment
8. Don't treat
9. Treat
10. Court takes guardianship
11. Her guardian
12. If a threat to health, the physician can treat under doctrine of in locum parentis
13. The girl herself
14. The girl herself
15. Her guardian
16. Yes
17. No
18. Yes, only one permission needed
19. Always
20. No
21. Yes
22. Yes, unless clear behavioral evidence that he is incompetent
23. Yes
24. **Answer: B**
25. **Answer: B**
26. **Answer: C**
27. **Answer: D**
28. **Answer: E**
29. **Answer: D**

Index

D

Q

R

S